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THE
CLIMATE OF BRIGHTON.

THE
CLIMATE OF BRIGHTON,

BY
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P R E F A C E.

The fact that Brighton, though containing a population falling little short, probably, during the season, of 100,000 persons, does not possess a single monograph on its climate, will, I trust, be considered a sufficient excuse for the appearance of the present work. The very discordant and erroneous opinions which at present exist on some of the most important qualities of its climate, as well as of the diseases to which it is adapted, may probably be attributed to this absence of any precise information on the subject. Though meteorology is still in its infancy, and the materials are still wanting to admit of any exact demonstration of the more minute properties of climates, or of any very strict comparison of the climates of different places, I trust that the present work may have the effect of setting at rest some questions concerning the climate of Brighton which are now disputed points; while I hope that the labours, which at the present time are being bestowed upon meteorological subjects, together with the observations which in Brighton, and many other places, are being made upon the physical properties of their respective climates, will enable me at no very distant period to supply some, perhaps many, of the defects of the present work. If in the following pages I have spoken highly of the climate of Brighton, it is only the expression of my sincere conviction: a conviction arrived at,

as the result of much study and observation on the subject. That Brighton is labouring under many sanitary defects it is impossible to deny: these I have never attempted to conceal, but, on the contrary, have endeavoured to bring them under the attention of the public, with a view to their removal, both in the present, and more particularly in a work on the sanitary state of Brighton, published in the year 1848. There can be no question that the diseases and epidemics which have arisen from this source have at different times brought the climate of Brighton into much unmerited disrepute. This was more particularly the case last year, when the most exaggerated and absurd reports were spread throughout the country of the prevalence of diphtheria in Brighton, causing great injury to the interests of the place. The returns of the Registrar General for the autumn quarter, indeed show that the rate of mortality in the more central parts of the town, occupied chiefly by the labouring classes, was in common with nearly all similar districts in the country, unusually high, arising principally from the prevalence of small-pox and scarlatina; but as regards diphtheria, I am prepared to show that the fatal cases in Brighton did not exceed, if they were not under, the general average of other places. But until the town has been put into a good sanitary condition, the public will be always too ready to believe and exaggerate any report of the unhealthiness of Brighton.

CONTENTS.

CHAPTER I.

| | PAGE. |
|--|-------|
| 1.—Definition of the term Climate. The Sun the Chief source of Heat. Isothermal Lines..... | 1 |
| 2.—The Influence of Land and Ocean Surfaces on Climates. Climates of the Southern and Northern Hemispheres compared..... | 8 |
| 3.—The origin of Winds, and their influence on Climates. Land and Sea Breezes..... | 14 |
| 4.—Causes of the Milder and more Equable Climates of Western Europe. The Gulf-Stream. The Progressive Severity of Climates in proportion to their Distance from the Sea..... | 20 |
| 5.—The extreme Climates of Northern and Central Asia, and North America | 24 |
| 6.—The Climate of England essentially mild or insular. A general view of the Climates of the different parts of England. England the healthiest Climate in Europe | 27 |

CHAPTER II.

| | |
|--|-----|
| 7.—Brighton: Its Position, Soil, &c., and the General Effect of the Sea and Down-Hills upon its Climate. The Annual Average Fall of Rain at Brighton and other Places compared. The Great Dryness of the Brighton Climate | 37 |
| 8.—The Winter Climate of Brighton. The Night and Day Temperatures, and its Comparison with that of Inland Places and others on the South Coast. Great Difference in the Temperature of the Exposed and Sheltered Parts of Brighton. The Sensations not to be depended upon as Affording any Criterion of the Temperature of a Place. The Winds. The Average Fall of Rain at Brighton and other Places during the Winter Months. The Smoke. The Milder and Damp Climate of the South-West Coast | 54 |
| 9.—Ungenial nature of the English Climate during the Spring Months. The effect of the Sea upon the Climate of Coasts during this period of the year. The Day Temperature colder than that of Inland Districts. The Spring Climate of Brighton considered. Fall of Rain. The direction of the Winds. The warmth of the front walks and Esplanades in clear weather. The great dryness of the Brighton Air during the Spring. Its comparison with other Sea-side places | 79 |
| 10.—The Summer Climate of Brighton. Effect of the Sea upon adjoining Coasts during hot weather. Greater coldness of the Day Temperature as contrasted with that of Inland Situations. The Day Temperatures of Brighton and Hassock's Gate compared. Erroneous impressions of the Summer Climate of Brighton. The direction of the Winds and average fall of Rain. The Summer formerly the season at Brighton. Sanative advantages of the Summer Climate at Brighton..... | 100 |
| 11.—The Autumn Climate of Brighton. The greater relative warmth of the days on the Sea-Coast on the approach of cold weather. The unusual severity of the cold during the | |

| | |
|---|-----|
| autumn of 1858. The mean Temperature. The Temperature at Brighton and Hyde Park at 9 a.m. compared. The mean direction of the winds. The average fall of Rain. The Autumn the season at Brighton. Its superiority over the winter much over-estimated. The danger incurred by delicate persons in sitting out too late in the evening during the latter part of Autumn..... | 119 |
|---|-----|

CHAPTER III.

| | |
|---|-----|
| 12.—The general efficacy of Climate and change of Air in the Cure of Diseases. The subject at present but little understood. Climate to be regarded rather as the means of placing Patients in the most favourable position for the action of other remedies | 125 |
| 13.—Distinction between the Natural and Artificial Climate of a place. Defective Sanitary Condition of Brighton. Mortality of Brighton from infectious diseases from 1854 to 1857. The rate of mortality at Brighton and several other Places compared. Estimate of the number of preventable Deaths at Brighton caused by sanitary neglect. The Improved Sanitary Condition of the Hove District of Brighton | 129 |
| 14.—Sussex the healthiest county in England. The great salubrity of the Brighton Climate. The unhealthy Autumn of 1858. The exaggerated report of the presence of Diphtheria in Brighton | 138 |
| 15.—Advantages of Brighton as a place of residence. The relative Salubrity of Town and Country Districts. The excessive rate of Infantile Mortality amongst the Operatives of large towns. London air comparatively innoxious to those whose youth has been spent in the country. The Children of the Rich not exempt from the injurious effects of the London Atmosphere. Brighton Climate particularly suited for Children and Convalescents from acute disorders | 144 |
| 16.—Sanative Properties of the Brighton Climate. Strumous or Scrofulous Affections of Children and Young Persons. Necessity of a prolonged sojourn in the place for the cure of those Complaints. The best period of the year for Scrofulous Disorders. Remarks on the Hygienic Management of Delicate Children. Medical Treatment in the Strumous Diseases of Children | 152 |
| 17.—Complaints consequent upon an impoverished condition of the Blood, and general Atony of the System, common in Young Persons..... | 161 |
| 18.—Agues. Chronic Bronchial Affections. Relaxed Sore Throat. Asthma. Dyspepsia. Bilious Headaches. Constipation. Dysmenorrhœa. Menorrhagia. Leucorrhœa. Apoplexy. Inflammatory Affections of the Brain. Chronic Pleurisy. Empyema. Convulsions in Children. Hooping Cough. Ophthalmia. Skin Complaints | 163 |
| 19.—Pulmonary Consumption. Causes of the Complaint. Climate less causative of Phthisis than is generally supposed. The Disease equally as prevalent amongst other European civilized communities. The Constitutional or Premonitory Stage of Consumption. Brighton considered as a Place of Residence for Consumptive People. The doubtful superiority of foreign climates over those afforded by our own country in this complaint | 167 |

CLIMATE OF BRIGHTON,

ETC.

CHAPTER I.

1.—*Definition of the term Climate. The Sun the Chief Source of Heat. Isothermal Lines.*

The term climate is variously applied by different Authors. By some, as by M. Forry,* it is used nearly coextensively with "Physical Geography." Climate constitutes, he says, "The aggregate of all external physical circumstances appertaining to each locality in its relation to organic life." In the usual, and more limited sense of the term, which is the meaning attached to it in the present work, it includes the various states and conditions of the atmosphere which perceptibly affect the bodily and mental organs of the human race. Though not strictly within the limits of the object of the work, I propose in the first instance to devote a few pages to the consideration of some of the principal laws of climate; for not only is the subject, though but little studied,

* See Buckle's History of Civilization, page 36.

intrinsically of great interest, but it is evident, that a slight knowledge of some of its more important phenomena, will be of material assistance in the investigation of the climate of any particular locality. Brighton being a sea-side place, my observations will be chiefly directed to the exposition of the distinctive characters of land, and maritime climates. The chief physical conditions which concur in forming the climate of a country have relation to its latitude; the proximity of the ocean, or other large masses of water; the extension and direction of the land; the geological and mineral formations constituting the bases of the soil, and the direction and arrangement of its strata; the elevation of the land above the level of the sea; and the vegetable productions on its surface.

For all practical purposes, the earth may be considered as deriving its superficial temperature entirely from the sun, in its elliptical course round that luminary. From the character of the fossil remains, which are found buried at considerable depths beneath the surface, and in great abundance in the carboniferous and cretaceous strata; and in transported soils and caves, where the bones of hyenas, tigers, elephants, rhinoceroses, and elephantine pachydermata have been discovered;* and which could have flourished only

* The following interesting account of the recent discovery of fossil remains in England is taken from the *Standard* daily newspaper:—There have recently been discovered in one of the limestone quarries at Preston, near Plymouth, the teeth, bones, and other

in a tropical climate, there is little room for doubt, that at a very distant period of the world's history, a much higher temperature than now exists, prevailed over the earth's surface; and scientific men have thrown out a conjecture, that in these earlier times, and in the then thinner condition of the crust of the earth, a considerable amount of the superficial temperature was derived from the central heat of the globe; and that the gradual cooling down of the earth, and the consequent corresponding diminution of the escape of central heat, is the principal cause of the present reduced temperature of the earth's surface. But however this may be, it is certain that the amount of heat received from this source at the present time is very trifling; and is stated not to be more than would melt, in the course of a year, a shell of ice covering the earth's surface, of a quarter of an inch thick; while the quantity received by the earth from the sun would, if equally

remains of lions, tigers, elephants, rhinoceroses, horses, hyenas, and other animals. This discovery has created quite a sensation in the geological world. The extreme remoteness of the age when these animals existed in Britain may be judged from the fact that the cavern from which the fossils were extracted is situate in the solid rock in the cliff of a quarry, which is about 100 feet from the edge of the sea. The cavern was 70 feet above the level of high water, and 35 feet below the surface of the field above; it was 20 feet long, 10 feet high, and about 70 feet wide. There was no aperture or other indication of its locality. Among the contents is the jaw of an animal of the horse species in stalagmite, exceedingly perfect. This is said to be the first ever found in stalagmite, and if so, establishes facts and gives rise to theories entirely new in geology. The break-water in the Sound is composed almost entirely of limestone worked from the Oreston quarries. The fossils are in the possession of Mr. Joseph, mineralogist, of Plymouth.

dispersed over its surface, melt during the same time, a stratum of ice forty-six feet in thickness. The amount of heat, therefore, from the latter source, is nearly two hundred times greater than that from the former.

The amount of heat annually received by the earth's surface from the sun, is precisely the same; and though the temperature of particular districts may vary from year to year, the diminution of heat in one place is compensated for, by the excess of it in another; and arises, not from any difference in the absolute amount of the sun's heating power, but simply from a varying distribution of it over different parts of the earth. The *intensity* of the sun's rays depends upon the direction they fall upon the earth: hence the greater warmth of the equatorial regions, and the difference between the summer and winter of the temperate, and Polar latitudes.

During the winter of the northern hemisphere, in fact, the earth is 3,000,000 of miles nearer the sun than it is during the summer; but the rays strike the earth more obliquely, and the same amount of heat is therefore diffused over a much wider extent of surface.

The atmosphere derives its heat, partly, by absorption from the sun's rays in their passage through it; and partly, by radiation, from the surface of the earth: in the proportion of about one-third of the former to two-thirds of the latter. In the summer, when the heating effect of the sun is increased, both by the greater intensity of its rays, and by the much

longer time that the earth is exposed to its action, a large portion of the heat it receives, sinks deep into the soil, which being given out again during the short days and long nights of winter, has the effect of considerably modifying the severity of the winter's cold. Were the whole quantity of heat which the earth receives in summer immediately radiated into space, it would render this period of the year inconveniently hot, perhaps uninhabitably so, even in our temperate regions; while it would depress the temperature of the winter months to the same extent.

It has been observed, that the intensity of the sun's rays depends upon the direction in which they fall upon the earth, diminishing in an exact ratio with their obliquity; and as this increases evenly from the equator to the poles, it might be expected, *a fortiori*, that the temperature of the earth's surface would be distributed in zones of equal mean annual heat, parallel to the equator, and to diminish regularly with the increasing distance from the latter. As a general rule this is the case, and hence the division of the globe into the torrid, the two temperate, and two frigid zones; but the temperature of a country is so much affected by other circumstances than the action of the sun's rays, or distance from the equator, especially by the relative position, and extent of sea and land, elevation of the land above the level of the sea, and the prevailing winds, that the latitude of a place can by no

means be taken as an exact measure of the temperature of its climate. It was for the purpose of illustrating this important fact, that the celebrated Geographer, Humbolt, invented the isothermal lines, which are suppositious lines encircling the earth, and passing through those places which have the same mean annual temperature. On tracing these lines on a map, it will be found, that they run parallel with the equator, or nearly so, only within the tropics; and that in the temperate and frigid zones, they deviate considerably, both from one another, and from the parallels of latitude. This is strikingly the case on comparing the mean temperature of the more western parts of Europe with districts in Asia, and those on the Eastern coast, and central parts of North America, under the same degree of latitude. For instance, Naples, which has a somewhat more northerly latitude than Pekin on the Eastern coast of Asia, and of Philadelphia on the Eastern coast of North America, has a mean annual temperature of nearly 9 degrees higher than either of these places. The same isothermal line which traverses latitude 43° in Europe, descends to latitude 36° in North America, and that which reaches Stockholm, latitude 60° , on the Western coast of Europe, descends to latitude 47° in North America; and to about the same point in Central Asia; making a difference of 7 degrees of latitude in the former instance, and 13 in the latter. And places in the three continents, situated in the

same latitude, present a difference of 11, and in some few instances even of 20 degrees of Fahrenheit's thermometer, in their mean annual temperature.

The difference of temperature between the hot and cold seasons is very slight in the equatorial regions, not amounting to more than two or three degrees. On approaching the poles it increases, being about 60° in the temperate zone; while in the northern parts of Asia the difference reaches 115° . Not only, however, do places of the same degree of latitude differ most materially in their mean annual temperature; but those, which have the same mean annual temperature, differ most essentially in the characters of their climates; some having mild winters and cool summers, while in others the extremes of heat and cold are excessive. The whole of the more Western parts of Europe also, contrast remarkably in this respect with the Eastern and central parts both of North America and Asia. At Quebec, for instance, which has a mean annual temperature of 9 degrees lower than London, the mean summer heat is 9 degrees higher, while in winter the cold is 25° greater. Pekin, on the Eastern coast of Asia, with a mean annual temperature of 3 degrees higher than London, has a summer temperature of 30 degrees in excess of that place, while during the winter it is 13 degrees colder.

2.—*The Influence of Land and Ocean Surfaces on Climates. Climates of the Southern and Northern Hemispheres compared.*

The most important cause of this unequal distribution of heat over the surface of the earth, as well, indeed, of the greater part of the varied phenomena of climate, is to be sought for, in the reciprocal influence exerted over the atmosphere, by the terrestrial and oceanic surfaces, by means of their different powers of absorbing and radiating the heat annually transmitted to them from the sun. Were the surface of the earth covered entirely, either by sea or land, and the latter were of an entirely homogeneous character, and evenly affected by the sun's rays, there would be an equality of climate over the entire surface of the earth; and the heat would be distributed in zones of decreasing temperature from the equator to the poles.

The land differs from the sea in its greater powers of radiating heat, and in the extent to which this varies according to the nature of its surface; whether bare or covered with different kinds of vegetations, elevated into high table-lands, hills, or mountains, depressed into valleys; or varying in the geological characters of the soil and the position of its strata. The heat received by the land from the sun is more quickly radiated back again into space; hence under a hot sun, and during the short nights of summer, the land-atmospheres become intensely heated;

while during the short days, and long nights of winter the temperature is proportionately depressed. Both the highest and lowest temperatures are therefore experienced in the interior of large continents, and this range of temperature between the hot and cold seasons, increases in proportion to the distance from the equalising influence of the sea. At Moscow for instance the range of temperature between summer and winter is three times, and in central Asia, at Jakoutsch, five times greater than on the sea coast of England, where the climate is tempered by the great Atlantic Ocean. The hottest region on the globe is probably in the interior of tropical Africa, where the mean equatorial temperature is $85^{\circ}.5$. The highest temperature that has been recorded is that by Burckhardt, at Esne, in Upper Egypt during a *chamsin*, when the thermometer reached 117° . The lowest— 69° was experienced by Captain Back in North America, when he traversed this continent for the purpose of joining Captain Ross. The difference between the two extremes is therefore 186° .

The depth to which the sun's heat penetrates into the earth, owing to its slow conducting power, is not great. In the temperate latitudes, of from 48° to 52° , it varies from 59 to 64 feet, and at half this depth, the annual variation of temperature on the surface is diminished to one degree. In all parts of the world below the stratum of invariable temperature, the heat increases

with the depth, at the rate of one degree for every 50 or 60 feet. Experiments in mines and Artesian wells have put this fact beyond a doubt; but no greater depth than 1700 feet has yet been reached. Whether or not, therefore, this law of increasing heat, obtains below this depth, remains a matter of conjecture; but the general opinion of scientific men is, that it does; and that consequently, every substance at a distance of about 20 miles below the surface is in a state of fusion; and that the heat in the centre of the globe is beyond anything the imagination can conceive.

The most important property of the ocean in respect of its influence on climates, is the tendency it has, in all latitudes, to preserve the same mean annual temperature; and by imparting this to the atmosphere on its surface, which is carried by the winds over adjoining coasts, it has the effect of moderating both the asperity of winter and the heat of summer. Owing to the mobility of its particles, there is a constant interchange between the hot and cold water of the tropical and polar regions, which is effected through the agency of the various currents which traverse the ocean in different directions; but the general effect of which is to carry the hot water of the tropics to higher and colder latitudes; and the cold water of the latter to the hot regions. It was the fact of the very low temperature of the sea found at great depths within the tropics,

that first led to the knowledge of a polar current flowing from either pole towards the equator; as without this current the depths of the tropical seas could only have a degree of cold equal to the lowest temperature of their surface water. The apparent anomaly offered in the Mediterranean, whose waters are found of a higher temperature than is usual at great depths, has been explained by Arago; and results from the circumstance, that at the Straits of Gibraltar, where the surface water of the Atlantic flows in as a westerly current, a counter current prevails beneath, and prevents the influx from the ocean of the cold current from the pole.* Thus though the sea absorbs a much larger quantity of the sun's heat than the land, and the heat sinks deeper into it, its temperature is lower than that of the land in tropical regions, and during the summer in the temperate zones; while in the polar latitudes and during the winter of the temperate regions, it is warmer than the land.

Within the tropics, when undisturbed by currents or the vicinity of land, the ocean maintains a remarkable uniformity of temperature over surfaces of many thousands of square miles, and has been found in its mean condition to be somewhat warmer than the atmosphere which rests upon it; which is about 82° in the tropical zone of

* Humbolt's *Cosmos*, p. 296.

the Atlantic, and two or three degrees warmer in the corresponding latitudes of the Pacific. Its temperature diminishes with its increasing depth; and in all latitudes it has a tendency to maintain a higher temperature on its surface, from the sinking of the cooler particles which are the heaviest. Owing to its intermixture with saline matters it attains its maximum density and freezes at a considerably lower temperature than fresh water. The relative amount of its saline contents increases towards the equator, where from the higher temperature, evaporation is the most rapid: varying however necessarily in its extent of saltiness, in proportion as the evaporation from its surface is affected by the more or less quiescent state of the atmosphere above it.

The extent of the oceanic surfaces of the globe is three times greater than that of the terrestrial surfaces; and of this latter, three-fourths are contained in the northern hemisphere. Bearing in mind the opposite effect of the sea and land upon the atmosphere; the tendency of the one being to equalize, while that of the other is to render the temperature excessive; we shall readily comprehend how it is, that the two hemispheres offer such a remarkable contrast in their climates. Owing to the great preponderance of the ocean in the southern hemisphere, the peculiar characteristics of oceanic climates greatly predominate. The isothermal lines, as well as those of mean summer

and winter temperature (*isothermal* and *isochimenal* lines) deviate but slightly either from themselves, or the parallels of latitude. The atmosphere is moist, warm, and equable, and vegetation flourishes, where in corresponding latitudes of the northern hemisphere, the ground is barren from excess of cold, and dryness of the atmosphere.

The only portions of the continents in the northern hemisphere which are materially affected by the ocean, are the western shores and districts of Europe, which are brought under the influence of the atmosphere of the great Atlantic Ocean; and the corresponding coasts of North America, washed by the North Pacific Ocean. These two enormous masses of water are hotter than the land in winter and colder than it in summer, and their moist and temperate atmospheres are carried over the western shores of these two continents by means of the prevailing south-west winds; which to the eastern borders of both America and Europe, and to the whole of central and Northern Asia, are dry land winds: hot during the summer and proportionally cold during the winter: hence the great difference in the climates of the western and eastern coasts of North America; and those of Western Europe and the eastern borders of Asia; which latter in fact form but one continental surface, of which Europe is the western peninsular.

3.—*The origin of Winds, and their influence on Climates. Land and Sea Breezes.*

The winds or currents prevailing in the atmosphere, which bring with them, in a more or less modified form, the general properties of distant climes, necessarily exert a most important influence on the climates of every portion of the globe. They have both a general and local operation: general, in the opposing currents of air which are constantly flowing between the two polar and the tropical regions, the effects of which are felt, at the same time, over extensive areas of surface: partial, when these two currents of air are deflected from their usual course by local causes of disturbance.

The winds, like nearly all other important meteorological phenomena, have their origin in the different distribution of heat over the earth's surface. The atmosphere follows the general law of matter, in expanding and becoming lighter under the influence of heat; and denser and heavier by cold. The mean temperature of the atmosphere at the equator is about 83° Far., and it often rises much higher. The temperature within the polar circles in the winter season descends many degrees below zero, and the difference in the mean temperature of these regions, and that of the tropics, is not probably less than 80° or 90° . The heated and rarefied atmosphere of the equator, is constantly rising to

the higher regions and flowing towards the poles; while the colder and denser air of the latter, rushes in the opposite direction towards the tropics, to restore the equilibrium. That these two opposite currents of air are constantly prevailing in the atmosphere is proved by the fact of the opposite course of the clouds at different heights; and the fact was further illustrated in a striking manner by an event which happened during the present century. The trade wind continually blows with great force from the island of Barbadoes to that of St. Vincent; notwithstanding which, during the eruption of a volcano in the island of St. Vincent in 1812, ashes fell in profusion from a great height in the atmosphere upon Barbadoes. This apparent transportation of matter against the wind, confirmed the opinion of the existence of a counter-current in the higher regions, which had previously rested on theoretical grounds only.*

If there were no other disturbing causes beyond the difference of temperature between the poles and the tropics, this would give rise to two opposite currents, one coming, in this hemisphere, strait from the north, while the other would flow in a direct course from the south; but the rotatory motion of the earth causes a considerable deflection of both currents from the direct line. That coming from the poles having in its advancing progress a less rotary motion

* Lyall, vol. 1, p. 188.

than the earth, strikes its surface in an easterly direction, and becomes in this hemisphere a north-east wind, and in the southern hemisphere a south-east. The other current from the equator, having a greater rotatory motion than the regions it passes over in its course to the poles, becomes in this hemisphere, a south-west, and in the other hemisphere a north-west wind. These two currents, the north-east and south-west, in our latitudes, their opposition, and the alternate displacement of one by the other, are the chief cause of the changes in the direction of the winds, of the variations of temperature, of the amount of moisture in the atmosphere and its precipitation in rain, and of other important meteorological phenomena.

The north-east, which is the surface or polar currents prevailing undisturbed, are the dominant winds during the spring months, at which time of the year they often blow without intermission for weeks together. They partake of the character of the climates they come from, being dry, keen, and chilling, precipitating the moisture of the air in fogs and mists; and are injurious to delicate chests, causing pulmonary and bronchitic inflammations, and agues. The south-west winds, which are the equatorial current, drawn down through the surface current; are the most frequent during the summer months, owing to the countries of Europe at this season of the year being warmer than the adjoining surfaces of the Atlantic.

They prevail generally, with only occasional short intervals, from June until the end of October, and during the winter months they alternate pretty evenly with the north-east winds. In the summer they are cool and moist, and are the cause of the greater quantity of rain which falls at this period of the year and during the autumn. But though these winds lower the temperature of the atmosphere of Western Europe during hot weather, in the winter their effect is to create warmth, owing to the sea, from which they derive their temperature, being then warmer than the land; and from the excessive quantity of moisture they contain, which is condensed by the cooler air of the land, they are the origin of the frequent fogs, mists, and showers which prevail on the western coasts of Europe, and particularly on that of our own island, during the autumn and winter months.

If the distribution of heat over the surface corresponded with the latitudes, these two currents, the equatorial and polar, would prevail alternately without intermission. But as the direction of the wind is affected by temperature, which, owing to the different radiating powers of the earth's surface, is so unequally distributed over it; it is evident that there must be partial winds over every part of the globe. In the equatorial regions these local causes of disturbance are the fewest, and there great regularity is observed

in the direction and force of the winds. But in higher latitudes, particularly in the northern hemisphere, where the land predominates in extent over the sea, and the alternations of temperature are consequently great, the regularity in the force and direction of the winds is proportionately affected; and it is not unfrequent, even within the limited area of England, to observe the winds blowing from several and almost opposite points of the compass at the same period of time; but high winds and storms, invariably, in this quarter of the globe, come either from the south-west or north-east.

The difference in the radiating properties of sea and land, cause in hot climates, a constant interchange: a *flux* and *reflux*: of atmosphere between the two surfaces, which constitutes the land and sea breezes of maritime places. During the day, the hot and rarefied atmosphere of the land ascends, and is replaced by the cooler and heavier air from the ocean, forming the cooling and refreshing sea-breeze, without which many places on the coast of tropical countries would be quite uninhabitable by Europeans. In the night, owing to the more rapid radiation of heat, the land soon becomes cooler than the sea, when a current of air is established from the land to the sea. In the morning and evening, there is no perceptible movement of air either way, as at these times, the temperature of the sea and land is about the same. These land and sea-breezes are very constant on the

coasts of nearly all tropical countries; and during a great part of the year on the shores of the Mediterranean; and are also felt, though in a much less degree, on the English coasts, during hot weather, and when their effect is not overcome by a stronger current of air in an opposite direction.

But it is a very important fact to be borne in mind, that the winds bring with them, not only the temperature and moisture of distant countries, but also the gaseous emanations and exhalations from marshy and malarious districts which they have traversed. These they freely imbibe and again impart to objects differently circumstanced, which they afterwards come in contact with. Thus places in themselves perfectly healthy, are affected by insalubrious districts in their vicinity: a fact well-known to the inhabitants of the localities adjoining the fenny districts of Kent and Essex, who dread a wind setting in from that direction, which invariably renders them liable to agues and intermittent fevers. Experience has shown that the foliage and leaves of trees attract and absorb these noxious exhalations as they circulate through them, especially at that time of the year when they are the most abundant and virulent; and it is owing to this circumstance that districts, with intervening woods and forests, enjoy a comparative exception from their injurious effects.*

* With reference to the above, my friend Mr Hingeston has mentioned to me the following interesting fact, which he ascertained

It is owing to the same cause—the transporting properties of the winds—that the various districts of large towns mutually affect and infect one another: that the comparatively open and healthy localities of the rich, suffer from many of the sources of disease, which have their origin in the undrained, pestiferous, and densely crowded districts of their poorer, and less fortunate neighbours.

4.—*Causes of the Milder and more Equable Climates of Western Europe. The Gulf-Stream. The Progressive Severity of Climates in proportion to their Distance from the Sea.*

The milder and more equable climate of Europe is due chiefly to the following circumstances:—1st, the deeply indented outline of its coasts, forming projecting peninsulars, and deep re-entering bays and inland seas; 2ndly, to a sea free from ice between its northern borders and the north pole; 3rdly, to the warming effect of the gulf-stream; and lastly, to the tempering effects of the prevailing south-west winds from the great Atlantic Ocean.

The effect of the gulf-stream is remarkable; and by bringing water to the shores of Europe of a considerably higher temperature, than the natural warmth of the sea in these

during a recent tour on the Continent:—"That Montpellier is not so healthy now as it was formerly, in consequence of the foliage of a large wooded district, which intervened between that town and the lagoons, bordering on the Mediterranean, having been entirely cleared away."

latitudes, and by counteracting the freezing of the sea to the north of Europe, greatly moderates the cold of the winter season. It is supposed to have its source in the heated waters of the Gulf of Mexico, which have a temperature of 86° : from 7 to 10 degrees warmer than the Atlantic Ocean in the same latitude. From these heated waters of the Gulf of Mexico, it passes through the Straits of Bahama, at the rate of three or four miles an hour, following a direction from S.S.W. to N.N.E., deviating more and more from the coast of the North American continent, until it reaches the banks of Newfoundland. At this point it is deflected still more to the east, traverses the whole extent of the Atlantic, and, still retaining a temperature of from four to five degrees above the surrounding ocean, washes the western coasts of the British Isles, and Norway, and deposits annually upon their shores the fruits and seeds of tropical America.

The effect of the sea to the north of Europe thus warmed by the gulf-stream, is to raise the winter temperature, by tempering the cold winds from the polar regions, which prevail at this season of the year, and particularly affects the winter climates of the north-western countries of Europe, which are strikingly mild for the latitudes in which they are placed. This is especially the case with the west coast of Norway, where the mean winter temperature is but two or three degrees colder than that of the

summer. Stromness, in the Orkneys, has a winter climate milder than Paris, which is 10 degrees further south; that of Copenhagen is upwards of four degrees higher than the winter temperature of Pekin, which is 17 degrees further south. Even in the Ferroe Islands, lat. 63° , the inland waters are said never to freeze.

The western borders of Europe, on the other hand, have their summer temperature moderated by their proximity to the broad expanse of the Atlantic Ocean, which is cooler than the land at this season of the year, and communicates its temperature to it, by means of the prevailing south-west winds, which have traversed its surface, and derived from it their temperature. In the winter these winds have the opposite effect, and bring to all the western borders of Europe a remarkably mild and moist atmosphere, as, at this season of the year, the sea becomes the warmest, and communicates its temperature to the winds.

If the north of Europe extended far within the boundaries of the polar region, or the gulf-stream ceased to flow, or if the south-west winds blew only during the summer, the winter climate of Europe would be greatly changed, and would be probably equal in severity to those of North America and Central Asia. If on the other hand the surface of the Atlantic were converted into land extending to the tropics, the south-west winds would be excessively dry and hot, and

would assimilate our summer climate to that of the north coast of Africa.

The mildest and most equable climates of Western Europe, are those of the British Isles, the Channel Islands (Guernsey, Jersey, and Alderney), with the neighbouring peninsular of Brittany, and the coast of Normandy. The mean annual temperature diminishes, and the difference of temperature between summer and winter increases, as we leave the western borders of Europe, and penetrate into the interior of the continent, through France, Germany, Poland, Hungary, and Russia, towards the central parts of Asia. The climate of London is more temperate and equable than that of Paris, Paris than Vienna, Vienna than Moscow, Moscow than Siberia. This fact is shown in the following table, which gives the mean summer and winter temperatures, and the difference between them, of some places in each of these countries :—

| PLACE. | Winter. | Summer. | Difference. |
|-------------------|---------|---------|-------------|
| | ° | ° | ° |
| Dublin..... | 39.2 | 59.5 | 20.3 |
| Edinburgh..... | 38.6 | 58.3 | 19.7 |
| London..... | 39.6 | 63.1 | 23.5 |
| Brussels..... | 36.8 | 66.2 | 29.4 |
| Amsterdam..... | 36.9 | 65.8 | 28.9 |
| Paris..... | 38.6 | 64.6 | 26 |
| Vienna..... | 32.7 | 69.3 | 36.6 |
| Prague..... | 31.5 | 68.9 | 37.4 |
| Warsaw..... | 28.8 | 69.1 | 40.3 |
| St. Petersburg... | 17.1 | 62.1 | 45 |
| Buda..... | 34 | 70.5 | 36.5 |
| Moscow..... | 10.8 | 67.1 | 56.3 |
| Kasan..... | 7.2 | 63.2 | 56 |
| Jakoutsk..... | -39.8 | 63 | 102 |

5.—*The extreme Climates of Northern and Central Asia, and North America.*

The most extreme climates on the globe are those of Northern and Central Asia. In these districts, at Tobolsk, Barnaul on the Obi, Irkoutsh, &c., the summer temperature often remains for weeks together at 86° or 87° Fah.; but these hot summers are followed by a winter, the coldest month of which has the severe mean temperature of from — 0° 4 to 4° 0 Fah., and the mercury often remains frozen for weeks together.

Bearing in mind what has been said, in the preceding pages, of the relative effects of sea and land, on the distribution of heat over the globe, the peculiarly excessive climates of Asia, as contrasted with those of Western Europe, will meet with an easy explanation: 1stly, in its more extended and compact form of surface, being five times greater than that of Europe; 2ndly, in the extension of its northern boundaries further into the polar regions; 3rdly, in its greater distance from the sea; 4thly, in its greater elevation above the level of the sea; and lastly, in the greater clearness of its atmosphere, which admits of freer radiation from the earth's surface.

The excessive heat of summer in these districts is caused by the immense extent of the land-surface, covered with scanty vegetation, which under the influence of a hot sun many hours above the horizon, radiates an exorbitant amount of heat into the atmos-

phere, untempered by the cooling effects of any sea breezes, which to these inland districts become in the summer parching land winds.

Land extending into the polar regions, lowers the temperature of the adjoining countries, by means of the refrigerating effects of the cold icy winds, which during the winter months blow chiefly from these regions. If placed below the 40 parallel of latitude, it has the opposite effect, of raising the temperature of the districts placed between it and the poles, owing to the great heat of its atmosphere—the effect of a powerfully radiating surface under a nearly vertical sun—which is communicated by the winds to neighbouring districts. This is the effect of Africa upon the climate of Europe, which like an immense furnace, distributes its heat to Arabia, Turkey in Asia, and Europe; but owing to the predominating south-west winds, the western parts of Europe are affected by it in a much less degree. There can be little doubt, however, that those parts of Europe which lie to the north-east of Africa, as Italy, Greece, and Turkey, have their temperature considerably increased by the hot winds from the African continent.

The extreme cold of the winter season in North America arises from the former of these causes: the extension of land far within the polar circle, where the elevated lands form immense reservoirs of ice and

snow, and whence the cold icy winds blow with unmitigated fury over the adjoining country. While in Europe the general character of the climates is temperate (the summers being cool and the winters mild), and in Asia the opposite conditions prevail (the seasons having extremes of temperature); in North America the winter climate approaches more to the severe temperature of Central Asia, and the summer to the cooler insular temperature of Europe. New York, for instance, has a summer temperature but a few degrees above that of Rome, which is in about the same latitude, but the temperature of its coldest month in winter is within one degree of that of Pekin. The summer climate of Quebec closely resembles that of Paris, and grapes ripen in the open air; but the mean winter temperature is four degrees within that of Moscow. This peculiarity in the climate of North America was much remarked by the earlier colonists, who were surprised to find in the corresponding latitudes of Great Britain and Italy, winters as severe as those of St. Petersburg and Moscow.

The western borders of North America, which, owing to the discovery of gold in California and New Caledonia, are now being rapidly colonized, are considerably milder, and the difference between summer and winter less than in the corresponding latitudes of the east coast; but they are still considerably more severe than the

west of Europe. Nain, on the east coast, in $57^{\circ}.10'$ N. lat., has a mean annual temperature of $25^{\circ}.2$ Fah., or $6^{\circ}.8$ below the freezing point; while Sitka, on the west coast, in $57^{\circ}.3'$ N. lat., has a mean temperature of $44^{\circ}.4$, being $12^{\circ}.4$ above the freezing point. At Nain, the mean summer temperature hardly attains $43^{\circ}.2$, while at Sitka it is $55^{\circ}.8$. The greater severity of the cold of Western America, as contrasted with Western Europe, is ascribed to the absence of any tropical current, bringing warm water to its shores, the current being here deflected from the coast of the continent, by the numerous small islands of the Pacific ocean. The greater extension of land towards the pole no doubt also contributes in no small degree to the same effect.

6.—*The Climate of England essentially mild or insular. A general view of the Climates of the different parts of England.*
England the healthiest Climate in Europe.

Having now gone over succinctly, but I hope not unintelligibly, some of the most important points in the phenomena of climate, and more particularly the difference between insular and continental climates; I will terminate this part of the work with a few observations upon the general characters of the climate of our own country; which I am the more anxious to do, as the subject

is not one which is generally understood by even English people themselves, who are too apt to decry their own climate, with whose defects they may be acquainted, and to set too high a value upon others, of which they have but a very partial knowledge, and which, though perhaps superior to England in some respects, are, taken as a whole, decidedly inferior to it.

The climate of England is essentially insular or maritime, the mean annual temperature being higher, and the difference between the seasons being less, than that of any other country of the same size, or of corresponding latitude, in this hemisphere. The Northern Island of New Zealand appears to possess a very close resemblance to England in the chief properties of its climate, a circumstance readily to be understood from its size and corresponding geographical position. Its mean annual temperature, however, would seem to be somewhat in excess of that of England, while the inequality of the seasons is less; owing no doubt to its lower latitude, and its greater distance from any large continent.

England owes its mild and equable climate, 1stly, to its being entirely surrounded by water, and having a great ocean on its west and southwest borders, stretching into the tropics, which preserves a higher temperature in the winter than the land in the same latitude, while it is cooler than it is in the summer; 2ndly, to

the prevalence of the south-west winds which communicate to our shores the temperature of the sea over which they have passed; 3rdly, to the effects of the gulf-stream, which during the winter, brings to our western coasts an immense body of water, from the tropical regions of America, and which, by raising the temperature of the sea between us and the north pole, tempers the cold icy winds which blow from these regions during the winter months; lastly, to our more cloudy and vaporous atmosphere, which cools the sun's rays during the summer, and checks radiation from the surface of the earth during the long nights of winter.

From the joint action of all these causes, the climate of England is considerably milder and more equable than corresponding situations on the adjoining continent, which are more affected by the cold winds from the large continental surface stretching northwards towards the pole, while they are less under the influence of the gulf-stream during the winter, and the cooling effects of the south-west winds during the summer. London, for instance, which is in about the same latitude as Brussels, and about the same distance from the sea, has a difference, between the mean summer and winter temperatures, of $23^{\circ}.5$, while in Brussels it is $29^{\circ}.5$, being 6° in excess of that of London. The table at page 23, and which might be greatly extended, will furnish

numerous other instances of the greater equableness of the English climate as contrasted with those of continental Europe.

As respects the climates of the various districts of England, it will be found as a general rule (but at the same time one which is interfered with by numerous local causes of disturbance, as the altitude of the district, the geological character of the soil, the nature of its surface, whether bare, cultivated, or abounding in woods and forests) that the seasons become more excessive, the winters being colder, and the summers warmer, the greater the distance from the sea; and, like the continents of Europe and Asia, and America, that the west coast is milder, more equable and moister than the east coast. This difference, however, is slight compared with that of the corresponding coasts of the continents, being in proportion to the small size of England as contrasted with the great extent of the former. Thus as regards the greater equableness of the coast-climates, the mean maximum day-temperature of the hottest month of the year, July, for five years, from 1853 to 1857 inclusive, at three places on the south-coast, viz., Brighton, Torquay, and Worthing, was 68° ; the mean minimum night temperature of the coldest month, January, for the same places, and during the same period of years, was $36^{\circ}.8$, making a range of $31^{\circ}.2$. At Greenwich, for the same period, the results were $73^{\circ}.6$ for the maximum day temperature, and 34° for the minimum, making a range of

temperature of $39^{\circ}.6$, or $8^{\circ}.4$ in excess of the south-coast. Sir James Clarke, in his work on climate (p. 124), has instituted a comparison between the climates of Gosport and London, taking the former as a specimen of the climate of the south-coast. But I do not consider that Gosport can be fairly considered in this light, as its climate is considerably influenced by the position of the Isle of Wight, which, being to the south-west of Gosport, affects the winds in their passage over it, giving to the climate of the latter more of an inland character than other places along the same coast, which the south-west winds reach fresh from the sea. Taking Gosport as the standard of comparisons, according to Sir James Clarke, the difference between the mean temperatures (the mean of all the highest and lowest) of the warmest and coldest month in London and the south-coast, is only two degrees in favour of the latter. But, according to the meteorological tables of Mr. Glaisher, appended to the quarterly returns of the Registrar-General, the average difference between the mean temperature of the hottest and coldest month of places situated on the south-coast, exposed to the full influence of the south-west winds, is nearly four degrees less than in London, or corresponding inland situations. The greater coolness of the summer and mildness of winter on the coast is due to the south-west winds, which reach the shore moderated by the temperature of the great Atlantic Ocean; but which

become hotter in summer and colder in winter, in proportion as they extend inland.

The south-west coasts and districts offer many important contrasts, in respect of climate, with the eastern divisions of the country. The former are more equable in their seasons, with a moist relaxing atmosphere; the latter are dry and harsh, with colder winters and hotter summers; and during the spring the easterly winds are particularly cold and irritating. The greater mildness and moistness of the south-west and west coasts is due to the higher temperature of the waters of the Atlantic, warmed by the gulf-stream, the atmosphere from which charged with moisture, on meeting with the colder air of the land, deposits the moisture in the form of rain, fogs, and mists, giving out at the same time a considerable quantity of latent heat, which still further tends to raise the temperature of the air. But in proportion as this atmosphere proceeds inland, it is deprived of these qualities, becoming both drier and colder; and thereby considerably diminishing the fall of rain. In the eastern and central parts of the country, the annual fall of rain varies from about 20 to 25 inches, whilst on the western coasts it is upwards of one-third more; and the number of rainy days is proportionably increased. On the west coast of Ireland it rains on 208 days in the year.

On the other hand, the cold east winds in the spring in passing over the land which

has been warmed by the sun's rays, are deprived of some of their keenness before they reach the western coasts, which consequently enjoy a milder and more genial spring than the eastern parts of the country.

The south coast, while it has the benefit of the tempering effect of the sea, in its cooler summers and warmer winters, enjoys a climate in other respects intermediate between these two extremes, approaching as a general rule (unless interfered with by some particular configuration of the land of the district itself, or some other local cause of disturbance), to either the one or the other in proportion as the situation is more or less distant from either the east or west coast. The climate of the whole of the south-coast of Cornwall and Devonshire is essentially equable, damp and relaxing. The fall of rain at Penzance is double that of London; and though the mean annual temperature is only about $1^{\circ}.5$ in excess of London, it is 5° warmer in winter, and 2° cooler in the summer. The whole of these two counties, in fact, with part of Somersetshire, owing to their peninsular form, with the Bristol channel on one side, and the English channel on the other, are more under the influence of the ocean-climate than any other part of England; and hence their well-known qualities of mildness and moistness of climate. A considerable change takes place on reaching the coasts of Dorsetshire and Hampshire; and still more so on the coast

of Sussex, where the annual fall of rain is much less, and the atmosphere drier and more bracing; but the north-east winds during the spring months are colder. The watering places on the coasts of Kent partake very much of the climate of the east coast, having colder winters and warmer summers, with a diminished fall of rain, drier atmosphere, and cold and ungenial springs.

Like other insular countries, however, the climate of England, while mild, and equable as respects the range of temperature between the seasons, is, at the same time, moist, subject to fogs during the autumn and winter, changeable in the daily vicissitudes of the weather, uncertain both in the commencement and duration of the seasons, and the spring months are harsh and trying to delicate persons.

The fogs, the dampness, frequent rains, and vicissitudes of the weather, with the accompanying colds, coughs, and rheumatisms of the English climate, indeed, are proverbial, even as contrasted with other temperate countries, and thousands annually quit its shores in pursuit of other and supposed more genial climates. That these are disadvantages—and where is the country without them—no one can deny; yet the robust and rounded forms, the great bodily endurance, the mental energy and activity of the Anglo-Saxon race, as shown in their rapid increase and extension over so large and increasing a portion of the globe,

together with the comparison of our mortality statistics with those of all other countries, where such records have been kept, afford certain proof, that the climate of England, though doubtless inferior in some respects to the clear atmosphere and more cloudless skies of more southern regions, is, taken as a whole, inferior to none in all those important qualities which conduce to the development of both the mental and bodily endowments of the human race. The Registrar General in his last (19th) annual report (p. xxiii.) on births, deaths, and marriages, says, "It is now established by extensive observation that England is the healthiest country in Europe. France stands next to England in salubrity. In continental cities the annual mortality is seldom less than 30 in 1000: and frequently as high as 40. In London the rate of mortality is only 25 in 1000. Statistical records prove that the climate of England is eminently salubrious; and it has not yet been shown, that the climate of any part of Europe is more salubrious than this island—crowned with hills of moderate elevation, sloping towards the east, and the south, bathed by the showers of the Atlantic, drained naturally by rivers running in short courses towards the sea, cultivated more extensively than other lands, and producing those unequalled breeds of sheep, cattle and horses, which flourish only in healthy places. The healthiest parts of England are not yet

places of general resort, but the annual mortality in the various districts comprising watering places seldom exceeds 21 in 1000 of the population, and is probably lower in those regions of the districts to which the visitors resort."

In the sixteenth annual report (p. 122) the Registrar General observes, "The actual health and vigour of the respective races are represented by the mean mortality, and the mean life-time; in both these respects England and France stand the first, Russia last, of the States from which data can be obtained :---

ANNUAL MORTALITY.

| | | | | |
|-------------|-----|-----|-----|---------|
| England ... | ... | ... | ... | 1 in 45 |
| France ... | ... | ... | ... | 1 in 42 |
| Prussia ... | ... | ... | ... | 1 in 38 |
| Austria ... | ... | ... | ... | 1 in 33 |
| Russia ... | ... | ... | ... | 1 in 28 |

CHAPTER II.

7.—*Brighton : Its Position, Soil, &c., and the General Effect of the Sea and Down-Hills upon its Climate. The Annual Average Fall of Rain at Brighton and other Places compared. The Great Dryness of the Brighton Climate.*

With the few foregoing general considerations on some of the most important phenomena of climate ; and particularly of the laws which regulate the diffusion of heat over the surface of the globe ; we shall be placed in a better position to investigate and understand the climate of any particular place or district.

Brighton derives the distinctive qualities of its climate from the sea on one side, and the South-Down range of hills which encircle it on the other. Being situated on the eastern side of a shallow bay, or indentation of the south line of coast, it has a S.W., or to be more exact, a S.S.W. aspect ; and is therefore exposed to the full effects of the winds from this quarter. The greater portion of the town stands upon the declivities of the receding sides of two ranges of hills, divided from one another by the valley leading to Preston ; the central portions only of the town occupying the flat

triangular surface, with the base towards the sea, which is formed between the slopes of the two hills. The eastern range of hills, upon which the Marine Parade and Kemp Town are built, terminates abruptly on the shore in cliffs varying from 60 to 80 feet in height: the western range, comprising the lower level or valley of the King's Road, slopes gradually down to the sea-beach. Behind the town the hills rise gradually to the height of about 450 feet, and from their summit, when the atmosphere is clear, the Isle of Wight can be distinctly seen with the naked eye.

The staple of the soil upon which the town stands, in fact, the whole of the south-down ranges of hills, is composed of a thick substratum of chalk, covered with a thin layer of earth. The soil, therefore, is remarkably porous, so much so, indeed, that no artificial drainage is required; neither are there any ditches, water-courses, or rivers, within six miles of the town. The whole of the pluvial waters pass off by infiltration; and, after heavy falls of rain, the water may be seen oozing through the margin of the land on the beach, and running in streams into the sea. There are several small patches of clay in the western portion of the town, in the neighbourhood of Brunswick Square; but as the surface slopes towards the sea, the moisture readily runs off; neither are they of sufficient extent perceptibly to affect the remarkable dryness of the locality itself, or of the parts near it.

The surface of the downs is covered with fine grass, suited only for the feeding of sheep, and, both from the nature of the soil and its exposure to the winds, is very bare of trees, or plantations, which can exist only in the valleys between the hills, where the soil is deeper, and the situations more sheltered. Of late years a considerable portion of the downs in the vicinity of the town has been converted into arable land, and produces very fine crops of wheat, for which, owing to the dryness of both the soil and atmosphere, it is remarkably well suited.

A comparatively slight knowledge of the general laws of climate, such as I have attempted to bring under the notice of my readers, in the first part of the work, would enable any one to form a good general idea of the climate of Brighton, from the manner in which it must be affected by the sea on one side, and by the downs which encircle it on the other. The slowness with which the sea parts with its heat, and follows the changes of the weather and seasons, and the effect of sea-winds, in moderating and equalizing the climates of adjoining coasts, are facts too well known to admit of the least dispute. Brighton cannot possibly form any exception to this general law; but like other places on the same coast, must be considerably influenced by the vicinity of an immense body of water, differing in temperature from that of the land; and by the south-west winds which blow nearly half the year from the sea, and derive their

temperature from it; and the general effect of which is to produce greater equableness of climate, both in the yearly and daily ranges of temperature. The difference of temperature, for instance, at the Greenwich Royal Observatory, taking the average of five years, from 1853 to 1857 inclusive, between the mean night minimum temperature of December, and the mean day maximum of July, was :—

39°.3.

At Brighton for the corresponding period, it was :—

30°,

making a difference of upwards of nine degrees in favour of the latter. Last year, 1857-58, this difference was upwards of 10° less at Brighton than at Greenwich.

The mean average daily range of temperature (the difference between the mean day-maximum and the mean night-minimum) for the same period of years for the two places, was

Greenwich.....16°.3

Brighton11°

being upwards of five degrees in favor of Brighton. Last year, for the twelve months from December, 1857, to November, 1858, in the west part of Brighton it was 7°.5 less than at Greenwich. But though the range of temperature at Brighton is thus considerably less than in inland situations, it will probably be found to be somewhat greater at Brighton than at the generality of other places along the same coast. This is doubtless due to the dry porous nature of the

soil, which has a tendency to cause greater ranges of temperature. "If we compare," observes Mr Glaisher, "places having the same latitude, we shall find that the mean temperature of those places situated inland will be higher in the summer months, and lower in the winter months than those situated in the vicinity of the sea. If we compare places differing only in their *geological formations*, we shall find that those places situated upon an *arid, dry soil*, will have a *greater range of temperature than those situated upon a clayey wet soil.*"*

The general effect of the sea upon the climate of Brighton is to raise the *mean* temperature of the air during the autumn and winter, as at these periods of the year the sea is warmer than the land. During the spring and summer, on the other hand, the *mean* temperature of the air is lowered by the sea, as then these circumstances are reversed, the sea being colder than the land. It is only, however, during the latter part of autumn, and the early months of winter, that the sea has any effect, and even then only slightly, in raising the mean maximum day-temperature, which at all other periods of the year is considerably above the temperature of the sea. Throughout the entire year, however, the temperature at night is raised by the sea, which is always several degrees warmer than the minimum night-temperature, and conse-

* Meteorology, by James Glaisher, F.R.S., &c., &c., page 26.

quently at these times it always imparts its heat to the atmosphere on the coast.

In respect of the general properties of the Brighton air, it holds an intermediate position between the damp and relaxing climates of the south-west coast, Penzance, Torquay, Weymouth, &c.; and the keen and harsher climates of places on our south-eastern and eastern shores; being considerably drier and more bracing than the former, and softer and warmer than the latter; particularly during the spring, and latter part of the winter, when throughout the eastern districts of the country the east winds are exceedingly cold, and irritating. Brighton, however, in respect of temperature and the sensation of cold, offers great variety of climate according as the situations are more or less elevated, sheltered or exposed. This subject will be treated of at greater length in a subsequent part of the work; but I may here mention, in passing, that all the observations of myself and others go to prove, that the elevated portions of the Montpelier district, in the neighbourhood of All Saints' Church, are decidedly the coldest, being exposed to the full effects of the strong currents of air from the downs. After this come the north-eastern districts, including the upper part of the Marine Parade, Kemp Town, and the portions of the town behind them on the north side of the Bristol Road, which are also very much exposed to the cold winds and draughts from the downs.

The central parts of the town, from the Old Steine to St. Peter's Church, are the most sheltered from the winds; by the rising downs behind, which protect them from the north-east winds; and by the buildings in front which break the force of the south-west winds; but being on a level surface and enclosed between hills, it is damper than any other part of the town; and I have noticed that in the autumn and winter, the night mists return earlier in the afternoon, and are dispersed later in the morning, than in the more elevated and exposed districts.

The low level or valley of the King's Road, though exposed to the full force of the south-west winds, is still more sheltered from the cold north-east winds, by the great mass of buildings and the hills behind, and is decidedly the warmest and mildest part of the town, offering a very marked contrast to the cold elevated part of the Montpelier district. Sir James Clarke speaks of 'the west cliff as being "somewhat damp,"* but I am at a loss to conceive how this can be so, taking into consideration its sloping surface, the general porous character of the soil, together with its direct exposure to the rays of the sun.

The great porosity of the soil in, and for several miles around Brighton (as evidenced by the absence of rivers, or ditches for carrying off the rain-fall), the quickness with

* Clarke on Climate, p. 129.

which the moisture dries up after rain, together with the absence of woods and plantations, or exuberant vegetation of any kind, all combine in giving great dryness to the atmosphere: a conclusion arrived at by Mr Cresy, who, in his recent inspection of the town, observes, "No place can be less exposed to humidity than Brighton."* For though the south-west winds necessarily contain a good deal of moisture, the effect of the constant evaporation from the surface of the sea, it is in a minutely divided and invisible state, in which condition it does not perceptibly affect the animal organism: in the same way that, though the atmosphere contains a much larger quantity of moisture in the summer than during the winter, it is considerably drier during the former period, as the moisture is intimately mixed up with it—while during the winter the moisture is condensed by the cold into fogs, mists, and vapours, which sensibly affect the feelings. I can never share in the regret expressed by many persons of the absence of vegetation in and around Brighton, as it is in no small degree owing to this circumstance, combined with the porous nature of the soil, that it owes during the autumn and winter its healthful, invigorating and bracing climate, giving it at this period of the year a great advantage over other places on the same coast. There is no doubt that woods and plantations

* Report to the General Board of Health, p. 5.

along the road-side add to the beauty of the scenery, but they intercept the currents of air, and in the autumn and winter render the atmosphere moist and damp—while the exhalations from the decaying vegetable matter after the fall of the leaf lessen its purity.

The following table shows the annual fall of rain at Brighton, Greenwich, and several places in Sussex, on an average of five years, from 1852 to 1857, omitting the year 1854, for which I am unable to obtain any returns for Brighton. The returns for Greenwich are taken from the Meteorological Table appended to the Quarterly Reports of the Registrar-General; those for Brighton for the years 1855-56-57, I have obtained from J. A. Hingeston, Esq., of Brighton; and the remainder from the Annual Meteorological Tables published by C. Leeson Prince, Esq., of Uckfield:—

| | | | | | IN. |
|-------------|-----|-----|-----|-----|------|
| Brighton | ... | ... | ... | ... | 25.6 |
| Uckfield | ... | ... | ... | ... | 34.3 |
| Chichester | ... | ... | ... | ... | 30.2 |
| Glynde ... | ... | ... | ... | ... | 32.3 |
| Buxted Park | ... | ... | ... | ... | 30.7 |
| Hastings | ... | ... | ... | ... | 29.1 |
| Greenwich | ... | ... | ... | ... | 25.5 |

It will be observed that the fall of rain at Brighton is considerably less than at other places in Sussex, and is only one-tenth of an inch greater than at the inland situation of Greenwich.

The diminished fall of rain at Brighton is doubtless owing to the high range of down hills behind the town, which attract the clouds, and condense the moisture into rain. It is not uncommon to see heavy clouds hanging over the downs, accompanied with heavy falls of rain, while at Brighton it is perfectly clear and bright. This accords with the observations of Dr. Martin* upon the fall of rain at Ventnor, which is less than in the interior of the island, and which he attributes to the same cause. "The high downs with which its rocky barrier to the north is capped attract the clouds in the neighbourhood, and, meeting with a cooler stratum of the atmosphere, favour the deposition of their contents."

The effect of hills and mountains upon the climate of neighbouring parts depends upon their height, vicinity, and position in respect of the direction of the winds. High hills, or isolated peaks of mountains, particularly, when forming reservoirs of ice and snow, by the cold descending currents on their declivities, depress the temperature of surrounding districts. When not very high, nor too distant, they either depress or raise the temperature, according as they impede the access of hot or cold winds. The downs being placed to the north and north-east of the town, and not being sufficiently high materially to lower the tempera-

* The Undercliff, Isle of Wight, by George A. Martin, M.D., p. 92.

ture of the air, must necessarily act as screens, or barriers, from these particular winds, to all the lower, and sheltered, parts of the town; while the higher parts, those for instance of the extreme east and north-east, and the Montpelier district, being exposed to their full force, have their temperature lowered in the same proportion. Neither can it be denied that even the warmest and most sheltered parts of the town: like all warm sheltered spots in the neighbourhood of the cooler atmosphere of hills, Ventnor and Hastings, for instance: are necessarily subject to cold draughts and currents of air rushing down to restore the equilibrium of the warmer and more rarified atmosphere of the valleys below. The Marine Parade and King's Road throughout their whole extent, at the ends of the streets which open on to them, suffer considerably from this inconvenience during the sunny days of winter, with a cold north-east wind.

It is not an uncommon opinion amongst the casual visitors of the place, and the same opinion is occasionally entertained by the residents, that the Brighton air has some stimulating effects upon the system, producing giddiness, and general febrile excitement, particularly in the newly arrived, and which I have heard ascribed to some peculiar action of the chalky soil upon the atmosphere. There is no evidence whatever to show that the soil has the least effect of this kind upon the atmosphere: whatever stimulating properties

it possesses (and there can be no question that it does occasionally affect new-comers in this way) is no doubt owing to the saline particles floating in it, and which it has in common with all other sea-side places; though perhaps the drier and more bracing quality of the atmosphere may cause it to affect the system more in the manner above mentioned, than is the case at some other places which are damper and more relaxing.

The only climatorial influences that can with any certainty be ascribed to the down hills around Brighton, are Firstly—that of causing great dryness of the atmosphere, and a greater range of temperature between the hot and cold seasons, from which it derives its bracing, invigorating qualities. Secondly—of affording a screen or shelter from the north and north-east winds to all the lower parts of the town. Thirdly—of causing descending draughts or currents of cold air during the cold sunny days of winter; and, lastly, of rendering the higher and more exposed parts of the town unusually keen and bracing for any district in the vicinity of the ocean on this coast. “If we compare the mean temperatures of places having the same latitude, we shall find that the mean value of those situated at the higher level will be less than those at the lower level.” (Glaisher’s *Meteorology*, p. 26.)

Such are the more prominent considerations which are applicable to a general view of the climate of Brighton; but this, like all other

places, varies so materially according to the period of the year, both in its influence over disease, and in its relation to other climates, that it will be necessary, in order to give anything approaching to a correct idea of the subject, to bring under review each season separately. In a work like the present it will be convenient, as well as more scientific, to take the meteorological division of the year, which divides the seasons according to the march of temperature, and which consequently includes the three coldest months, viz., December, January, and February, in the winter quarter; the hottest, June, July, and August, in the summer; and the intervening months respectively, in the spring and autumn quarters.

METEOROLOGICAL TABLE FOR DECEMBER, 1857.

| TABLE, No. 1. | Highest. | Lowest. | Range. | Mean | | | | | | | | Sea. | | Winds, direction. | | | | Rain. | |
|---------------------------------------|----------|---------|--------|-----------------|----------------|--------------|---------------------|-------------------|---------------|-------------------|--------------------------|----------|---------|-------------------|-----------------------|-----------------|-------------|-------------|---------|
| | | | | Of all Highest. | Of all Lowest. | Daily range. | Temperature of air. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and North East. | South and East. | North West. | No. of days | Amount. |
| | | | | | | | | | | | | | | | | | | | |
| Col. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |
| BRIGHTON: | | | | | | | | | | | | | | | | | | | |
| West Cliff, — Dr. Kebbell..... | 56 | 36 | 20 | 50 | 41 | 6 | 46.4 | 46.5 | 48.3 | 48.4 | ° | ° | ° | 18 | 15. | 16. | 17. | 18. | In. 0.5 |
| North Central, "Brighton Herald" | 55 | 33 | 22 | 50.6 | 43.5 | 7.1 | 47 | | | | 54.5 | 49.5 | | 18 | 10 | 3 | | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | |
| Greenwich, — Royal Observatory. | 57 | 30.8 | 26.2 | 50.3 | 39.6 | 10.7 | 45 | 42.5 | 47 | | | | | | | | | 6 | 0.5 |
| Hyde Park, — Mr H. Williams. | 55 | 27 | 29 | 49.7 | 39.5 | 10.2 | 44.6 | | | | 62 | | | | | | | 13 | 0.9 |
| Uckfield, — C. L. Prince, Esq. | 56.8 | 30 | 26.8 | 49.8 | 38.2 | 11.6 | 44.1 | | | | | | | | | | | 9 | 0.5 |
| Nottingham. | 54 | 25 | 29 | 50.5 | 38.2 | 12.3 | 44.3 | | | | | | | | | | | 8 | 0.3 |
| York. | 59 | 29 | 30 | 51.3 | 41.3 | 10 | 46.4 | | | | | | | | | | | | 0.8 |
| Gloucester. | 55 | 32 | 23 | 51.7 | 40.1 | 11.6 | 46 | | | | | | | | | | | 11 | 1 |
| COAST DISTRICTS: | | | | | | | | | | | | | | | | | | | |
| Ryde. | 55 | 32 | 23 | 51.7 | 40.1 | 11.6 | 46 | | | | | | | | | | | 13 | 3.9 |
| Venstor. | 57 | 40 | 17 | 52.2 | 46.2 | 6 | 49.3 | | | | | | | | | | | 10 | 0.6 |
| Worthing. | 57.4 | 35.5 | 21.9 | 50.2 | 44.6 | 5.6 | 47.5 | | | | | | | | | | | 8 | 0.8 |
| Hastings. | 55 | 35.5 | 19.5 | 50.5 | 43.6 | 6.9 | 47.2 | | | | | | | | | | | | |
| Col. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |

METEOROLOGICAL TABLE FOR JANUARY, 1858.

TABLE, No. 2.

| TABLE, No. 2. | | Mean | | | | | | | | | | | | | | | | | | Sen. | | Winds, direction. | | | | Rain. | |
|---------------------------------------|----------|---------|--------|-----------------|----------------|------|------|------|------|-------------------------|--------------|------|-----|---------------|------|-------------------|--------------------------|----------|---------|-------------|-----------------------|-------------------|--------------|---------|-----|-------|--|
| Col. | Highest. | Lowest. | Range. | Daily range. | | | | | | Temperature of the air. | At 9 o'clock | | | At 12 o'clock | | At 3 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and South East. | North West. | No. of days. | Amount. | | | |
| | | | | Of all Highest. | Of all Lowest. | 6. | 7. | 8. | 9. | | 10. | 11. | | | | | | | | | | | | | | | |
| BRIGHTON: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebb. | 50 | 24 | 26 | 43.1 | 36.1 | ° | ° | ° | ° | 39.4 | 39.1 | ° | ° | 42.3 | 50 | ° | ° | ° | 42 | 13 | 14. | 15. | 16. | 17. | 18. | 19. | |
| Kemp Town,—J. O. N. Rutter, Esq. | 51 | 22 | 29 | 42.5 | 33.9 | ° | 7 | 8.0 | 38.2 | 38 | 42.4 | 39.3 | | | | 45 | 45 | 42 | 13 | 8 | 6 | 4 | 5 | 0.7 | | | |
| North Central,—“Brighton Herald.” | 50 | 24 | 26 | 43.3 | 34 | ° | 9.3 | 38.4 | | | | | | | | | | | | | | | | | | | |
| Montpelier Dist.—J. A. Hingston, Esq. | 48 | 22 | 26 | 40.2 | 32.5 | ° | 7.7 | 36.1 | | | | | | | | | | | | | | | | | | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | 51.9 | 20.9 | 31 | 43.8 | 31.7 | 12.1 | 37.5 | | | | | | | | 47.3 | | | | | | | | | | 5 | 0.7 | |
| Hyde Park,—Mr H. Williams. | 23 | | | 32.2 | | | | 36.1 | 40.2 | | | | | | | | | | | | | | | | 6 | 1.2 | |
| Uckfield,—C. L. Prince, Esq. | 51 | 21 | 30 | 44.1 | 30.6 | 13.5 | 37.1 | | | | | | | | | | | | | | | | | | 6 | 0.2 | |
| Nottingham. | 54 | 22.8 | 31.2 | 43.3 | 21.4 | 11.9 | 37.1 | | | | | | | | | | | | | | | | | | 12 | 0.4 | |
| Gloucester. | 54 | 23 | 31 | 45.4 | 32.5 | 12.9 | 38.4 | | | | | | | | | | | | | | | | | | 4 | 0.5 | |
| York. | 53 | 21 | 32 | 40.4 | 30.4 | 10 | 35.2 | | | | | | | | | | | | | | | | | | 12 | 1.6 | |
| COAST DISTRICTS: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Torquay. | 53 | 25 | 28 | 46.3 | 37.5 | 8.8 | 41.7 | | | | | | | | | | | | | | | | | | 11 | 1.5 | |
| Ventnor. | 53 | 26 | 27 | 47.3 | 38.5 | 8.8 | 42.7 | | | | | | | | | | | | | | | | | | 7 | 0.8 | |
| Worthing. | 49 | 25 | 24 | 45.2 | 35.6 | 9.6 | 40.2 | | | | | | | | | | | | | | | | | | 8 | 1.5 | |
| Hastings. | 50.5 | 23.5 | 27 | 44.2 | 35.1 | 9.1 | 39.4 | | | | | | | | | | | | | | | | | | | 0.6 | |
| Ryde. | 52 | 20 | 32 | 46.7 | 36.2 | 10.5 | 41.2 | | | | | | | | | | | | | | | | | | | | |
| Col. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | | | | | | | | |

METEOROLOGICAL TABLE,

Showing the monthly mean highest temperature by day; the monthly mean lowest temperature by night; the monthly mean daily range; and the mean temperature of the month; at Brighton, and of six other places during a period of five years from 1853 to 1857 inclusive.

| TABLE No. 4. | DECEMBER. | | | | JANUARY. | | | | FEBRUARY. | | | |
|------------------|-----------|---------|--------|--------------------------------|----------|---------|--------|--------------------------------|-----------|---------|--------|--------------------------------|
| | Highest. | Lowest. | Range. | Mean temperature of the month. | Highest. | Lowest. | Range. | Mean temperature of the month. | Highest. | Lowest. | Range. | Mean temperature of the month. |
| Brighton | 46.6 | 38 | 8.6 | 42 | 43 | 36 | 7 | 39.3 | 42.4 | 33.1 | 9.3 | 37.3 |
| Greenwich | 44.3 | 34.3 | 10 | 39.2 | 43.3 | 34 | 9.4 | 38.4 | 43.3 | 31.5 | 11.8 | 37 |
| Nottingham | 41 | 33 | 8 | 36.8 | 42.5 | 32 | 10.5 | 37 | 41.8 | 30.2 | 11.6 | 35.6 |
| Uckfield | 44.3 | 34 | 10.3 | 39 | 44 | 33.9 | 10.1 | 38.8 | 44.3 | 31 | 13.3 | 37.2 |
| Ventnor | 47.2 | 39.6 | 7.6 | 43.2 | 45.2 | 38.5 | 6.7 | 41.6 | 44.3 | 35.8 | 8.5 | 39.6 |
| Worthing | 44.3 | 36.6 | 7.7 | 40.2 | 43 | 36 | 7 | 39.3 | 41.5 | 33.3 | 8.2 | 37 |
| Ryde | 46.6 | 35.4 | 11.2 | 41.4 | 45.5 | 35.2 | 10 | 40 | 44 | 31.7 | 12.3 | 37.4 |

WINTER.

DECEMBER, JANUARY, FEBRUARY.

- 8.—*The Winter Climate of Brighton. The Night and Day Temperature, and its Comparison with that of Inland Places and others on the South Coast. Great Difference in the Temperature of the Exposed and Sheltered Parts of Brighton. The Sensations not to be depended upon as Affording any Criterion of the Temperature of a Place. The Winds. The Average Fall of Rain at Brighton and other Places during the Winter Months. The Smoke. The Milder and Damper Climates of the South-West Coast.*

The tables, Nos. 1, 2 and 3, for the three winter months, show in the three first columns respectively, the highest, and lowest, temperatures reached in the shade during the month; and the range, or difference of temperature, between these two extremes. The columns 4 and 5 show the monthly *mean* maximum temperature by day in the shade; and the monthly *mean* minimum by night. These results are obtained by adding together separately the readings for each day, and dividing

the sums by the number of days in the month. The mean monthly daily range (col. 6) is obtained by taking the difference between the mean of all the highest readings by day, and the mean of all the lowest readings by night. The mean temperature of the air (col. 7) is obtained by taking the half of the sum of the mean maximum and minimum temperatures, and deducting from it the following numbers for each month in the year; according to the recommendation of Mr Glaisher,* who has ascertained by observations, extending over a series of years, that the simple arithmetical mean of the maximum and minimum temperature does not give the exact mean temperature of the air:—

| | | |
|------------------------------|---------------------------|-----------------------------|
| January ....0.2 ^o | May .....1.7 ^o | September..1.3 ^o |
| February...0.4 | June .....1.8 | October ....1.0 |
| March .....1.0 | July.....1.9 | November..0.4 |
| April.....1.5 | August ....1.7 | December...0.0 |

The columns 8, 9 and 10 show the mean temperature of the air, at 9 a.m., 12 o'clock, and 3 p.m.; and are interesting, as affording a comparison between the temperature of Brighton and that of Hyde Park, London, and of the different parts of Brighton at these periods of the day. The statements at the headings will give a sufficient explanation of the remaining columns. The whole of these returns, with the exception of those

* Glaisher's Meteorology, p. 24.

for Brighton and Hyde Park, are extracted from Mr Glaisher's Meteorological Tables, appended to the quarterly returns of the Registrar General.

The perusal of the foregoing tables (col. 5) will demonstrate one very important fact in the comparison of the relative temperatures of coast and inland climates, viz., that the mean night temperature of coast districts is considerably higher than that of land districts; and this we shall find to be the case, not only during the winter, but, in varying proportions, throughout the whole year. As contrasted with the returns from the Royal Humane's Receiving House, Hyde Park, which I have been kindly favoured with by Mr Williams, the Superintendent; and those of the Royal Observatory, Greenwich, which places correspond very closely in their night-temperature, we find that the mean excess for the western division of Brighton, for the three months, is a little over four degrees. But the simple fact of knowing that the mean winter night-temperature of Brighton on the coast, is four degrees warmer than that of London, and five or six warmer than those of more northerly places, is very far from demonstrating the full extent of the difference between the two climates: as during the prevalence of the south-west winds the difference in temperature is reduced to two or three degrees, and is not unfrequently the same in both places; while during cold

weather, with north-east winds, the difference is increased in the same proportion; and during very sharp nights it is not unfrequently equal to eight degrees in favour of the warmth of climates on the coast.

The table No. 4, giving the average of five years, shows nearly the same result for each month as that for last year.

It will also be observed that the coldest part of Brighton, the Montpelier district, 200 feet above the level of the sea, is still warmer at night than either Hyde Park or Greenwich.

The returns for the other sea-side places, taken from the Registrar-General's Quarterly Report, particularly Worthing and Hastings, the two places nearest to Brighton, present, in their night-temperatures, a remarkably close approximation to the results obtained for the warmer and more sheltered parts of this place. Torquay and Ventnor would seem to be somewhat milder. As respects the latter place, however, if the observations are still taken in an observatory with "a thatched roof, supported on wooden uprights partly resting against a wall," though "in a most exposed situation," as stated by Dr. Martin in his preface (p. vii.) to his work *On Climate*, I cannot but think that by checking radiation from the ground, particularly on cold, clear nights, it must affect the thermometer and give a higher temperature than would be obtained if the shelter from above were removed, and the situation

freely exposed. This same circumstance of position, by impeding the rays of the sun, would no doubt also give a somewhat lower temperature in summer. This circumstance must be taken into account when comparing the returns from Ventnor with those of other places, where, as is the case with those of the different parts of Brighton, the thermometers are more freely exposed to the air.

The greater mildness of the nights at sea-side places is due to the warming effect of the ocean. I found from careful observation, that the mean temperature of the sea off the coast of Brighton last year, was for December 52° , January 44° , and February $41^{\circ}.5$. The lowest point reached during the winter was 38° . (See tables Nos. 1, 2, and 3, cols. 12 and 13.) The effect of this immense body of water upon the atmosphere immediately above it, and differing from it in temperature, is obvious: when the temperature of the atmosphere is below that of the water, the latter gives out its heat to restore the equilibrium, and the result is that the water is cooled while the atmosphere has its temperature raised. The amount of heat given out by the sea in this way depends upon the extent of the difference of temperature between the two contiguous bodies; being greater in proportion to the difference between them: so that, the colder the night, the greater the quantity of heat the atmosphere obtains from the sea;

and thus it is that, places on the coast, washed by a sea of high temperature, never experience the excessive cold, common to large inland districts.

On comparing the day-temperature during the winter with that of inland districts, we find that the monthly *mean* day-maximum temperature (col. 5) of the western division of Brighton last year was slightly under that of Greenwich throughout the three months. In the north-central district during December it was slightly in excess of that of Greenwich. The average of five years also (see table 4) for the same (north-central) district, gives an excess over Greenwich of $2^{\circ}.3$ during December, after which during January and February it falls slightly below it.

During the spring and summer, the temperature of the sea is considerably colder than the mean highest day-temperature of the atmosphere on the land; but as the power of the sun diminishes in the autumn, the land parts with its heat by radiation much more rapidly than the sea; so that the sea then gradually becomes the warmest, and continues so up to the end of December. The sea would therefore have the effect of raising the mean maximum day-temperature during this month, which accounts for Brighton, upon an average of years, having a higher day maximum temperature, during December, than Greenwich. After December, as the sea loses its heat, its general effect is, during January and February, slightly to keep down

the temperature of the middle, or hottest period, of the day. During the mornings, however, up to about 12 o'clock, and again after 2 o'clock p.m., when the heat of the sun diminishes, the sea has the effect throughout the whole winter, and in fact during the greater part of the spring, of raising the temperature of the atmosphere of adjoining coasts. At 9 o'clock in the morning (col. 8) during December, it is four degrees, during January, three degrees, and during February, two degrees warmer than at Hyde Park, at the same hour of the day. I am not in possession of any returns of the temperature at 3 o'clock p.m. from any inland district, so as to be able to compare them with this period of the day at Brighton; but if the mornings and nights are warmer, there can be little doubt that the afternoons and evenings must be so also.

The highest temperatures (col. 1), however, are always experienced in inland districts. This happens during clear weather, when the inland atmosphere derives greater warmth by the radiation of heat from the surface of the land, than it does on the coast, where the sun's rays are more freely absorbed by the sea, and become for the time latent. On the other hand, during very cold cloudy weather, when the land is colder than the sea, the atmosphere on coasts is warmed by the escape of heat from the sea, and consequently seldom or never falls so low as it does on large inland places. The climate of coasts, therefore, is

not only more equable, in respect of the range between the day-maximum and the night-minimum, but also in the successive *daily* ranges of temperature, contrasting the temperature of one day with another.

Owing chiefly to the warmer nights, the mean range of temperature between the day maximum and the night minimum (col. 6) at Brighton, as well as at all other sea-side places (excepting Ryde, which, in most particulars, has a land climate), is considerably less than in inland districts. This difference at Brighton and Greenwich respectively, for the winter three months, 1857-58, was :—

| | DEC. | JAN. | FEB. |
|----------------|-------|-------|------|
| Brighton..... | 6° | 7° | 7°·6 |
| Greenwich..... | 10°·7 | 12°·1 | 12° |

This greater equableness and steadiness of temperature is a very important feature in the sanative properties of climates, especially in relation to pulmonary complaints, in which sudden changes of temperature are always very prejudicial.

The general effect, then, of the sea upon the climate of adjoining coasts during the winter may be thus briefly stated—1stly., to render the mornings, evenings, and nights warmer; 2ndly, to raise the mean day maximum temperature during December, to depress it very slightly during January, and to the extent of about a degree and a half during February; 3rdly, to produce through-

out the four and twenty hours, as well as on successive days, greater equableness of temperature; and 4thly, owing chiefly to the warmer nights, to raise the mean temperature of the air.

Many persons on first arriving at Brighton, during the winter, experience a sensation of chilliness and fancy that the place is cold; and some of the resident inhabitants also entertain the same opinion. But Brighton is a place whose climate, in respect of temperature, varies very much in its more or less sheltered, or exposed situations. There can be no question, that the parts to the extreme east, and north-eastern outskirts, and the elevated portions of the Montpelier district, in the neighbourhood of Montpelier Crescent, and All Saints' Church, do convey to the feelings, the impression of great cold; for not only is the actual temperature of the atmosphere lower in these situations, especially in that last-mentioned; but they are exposed to the full force of the sharp currents of air from the downs behind, which carry off the animal heat very quickly, and affect the sensations to a greater extent than is indicated by the thermometer; so that these situations appear to the feelings considerably colder than they really are.

But the parts of the town along the front near the sea, particularly the low level of the King's Road along its whole extent, have not only a warmer atmosphere, but are sheltered

by the buildings and hills rising behind from the cold draughts and currents of air from the downs, and possess consequently a very different climate. No two places many miles distant along the same coast, probably, differ so much, in respect of temperature, as do the higher and more exposed, and the lower and more sheltered parts of Brighton. Any one therefore in speaking of the climate of Brighton, should mention to what part of the town he refers, or his statements can have no definite meaning. All the observations which have hitherto been made by means of instruments on the temperature of the lower parts of the town, near the sea, together with the well-known tempering effect of the ocean upon adjoining coasts, go to prove that—with the exception of two or three hours of the middle of the day during the month of February—the winters are milder at Brighton than in inland districts. Yet I have not unfrequently heard persons from London complain of the chilliness and coldness of the air in the warmest and more sheltered parts of the town. And it is not unlikely that the purer, more bracing, and more freely-circulating atmosphere of even the warmest situations of Brighton, as contrasted with the close and stiller atmosphere of London, may convey to the feelings the sensation of greater cold, when, in fact, there may be but very little difference, in the actual temperatures of the two atmo-

spheres. For the central parts of London, owing to the warmth and protection afforded by such an immense mass of buildings, are milder than Greenwich, and the other outskirts; and would seem also to be slightly warmer than Brighton, to the extent of a degree or two, during the middle of the day; but this slight difference of temperature would not be very perceptible to the feelings, were the atmospheres of the two places similar in other respects.

I may here object to the common practise of judging of the climate of places solely from the effect of the atmosphere upon the bodily sensations. The human body is not a meteorological instrument, which marks with undeviating exactness, in accordance with certain physical laws, the various conditions and changes of the atmosphere; but is liable to be affected by a variety of accidental and extraneous circumstances, arising out of the state of health at the time, idiosyncrasy of constitution, and the previous conditions of the weather, which, of all the means of judging of climate and of temperature in particular, renders it the most liable to error. A person, for instance, suffering from feeble digestive powers, or from a casual attack of indigestion, is more susceptible of changes of temperature—feels the cold more acutely—than a healthy person, or than the same person would with his stomach in a healthy condition, and his meal properly

digested. Rheumatic and gouty people are peculiarly susceptible of any changes in the hydrometric conditions of the atmosphere. Others are affected to an unusual extent by its different electric and barometric conditions.

As respects the effects of previous temperature upon the feelings, a person would feel a sudden fall of fifteen or twenty degrees in the temperature just as much, whether the change were from 50° or ten degrees lower; so that all sudden changes of temperature invariably cause the same complaint of *bitter cold*, however relatively mild any place may be. Two persons arriving at the same place, one from a hot, the other from a cold climate, would be affected very differently by the temperature of the air: to the one it would appear very cold, to the other hot; in the same way, that the same basin of water would appear hot to one hand, and cold to the other, after each had been placed for some time in two different basins of water of opposite temperatures. How little, in fact, the bodily sensations are to be depended upon as affording any exact criterion of the temperature of the atmosphere, will be readily conceded, when we find two travellers, one in the polar regions, speaking of a temperature of 15° (seventeen degrees below freezing point) as being unpleasantly warm; while another in the tropical parts of Africa complains of the feeling of bitter cold with the thermometer standing at 42° , or ten degrees above freezing point.

“The following is a correct scale of the physical effects of cold calculated for the latitude of 65° — 70° north* :—

“ 15° above Zero—*unpleasantly warm*.

“Zero—mild and agreeable.

“ 10° below Zero—pleasantly fresh and bracing.

“ 20° below Zero—sharp, but not severely cold. Keep your fingers and toes in motion, and rub your nose occasionally.

“ 30° below Zero—very cold. Take particular care of your nose and extremities. Eat the fattest food, and plenty of it.

“ 40° below Zero—intensely cold. Keep awake at all hazards. Muffle up the eyes, and test your circulation frequently, that it may not stop somewhere before you know it.

“ 50° below Zero—a struggle for life.”

Dr. Livingston remarks :—“The cold in the morning was now severe to the feelings, the thermometer varying from 58° to 60° ”†

“During the prevalence of the south-west wind, the thermometer sinks as low as 42° , and conveys the impression of bitter cold.”‡

All places on the sea-coast have the advantage of considerable changes of climate according to the direction of the winds. When they blow from the sea, the air reaches the coast, impregnated with saline particles, of about the same temperature as the sea itself,

* Northern Travels; Summer and Winter Sketches of Sweden, Lapland, and Norway, by Bayard Taylor.

† Dr. Livingston's Travels in Africa, p. 460.

‡ Ditto, p. 463.

and entirely free from all miasmatic, or other injurious exhalations from the earth. The inhabitants, in fact, have the advantage of breathing an atmosphere almost as entirely marine as it is on the surface of the sea itself many miles distant from the land. But when the wind comes from the land side, the air is affected by the nature of the country over which it has past; and the atmosphere of the place is necessarily assimilated to the climate of inland places. Taking the average of the last six years, the directions of the wind during the three winter months has been as follows:—

| | South-West. | North & North-East. | South and South-East. | Other directions | No. of Days. |
|--------------|-------------|------------------------|--------------------------|---------------------|-----------------|
| December ... | 13 | 12 | 4 | 2 | 31 |
| January..... | 11.5 | 13.3 | 4.2 | 2 | 31 |
| February.... | 6.7 | 16 | 4 | 1.3 | 28 |

It will be observed that the south-west and the north-east are the dominant winds, and that the former diminishes, while the latter increases, towards the spring of the year. The south-west winds, which are the equatorial current drawn down to the surface of the earth, are always relatively mild and genial during the winter, bringing to us, in fact, the climate of more southern and warmer latitudes. They blow, on the average, during December, 13 days, January 11 days and a half, and February six days and a half out of the month. The great mildness of December, last year (1857), was

owing to the prevalence of these winds, which blew 20 days out of the 31 from this quarter.

The north-east winds, which are the polar current prevailing undisturbed, but deflected from the straight southerly direction by the rotatory motion of the earth, are necessarily always more or less cold winds during the winter, as they come from the freezing regions of higher latitudes. They are somewhat less prevalent than the south-west winds during December, but increase in frequency towards the spring. They reach Brighton after having passed over the surface of the downs, where their temperature, doubtless, is somewhat lowered; but they are at the same time deprived of part of their moisture, and rendered drier and more bracing. It is during the prevalence of these winds that the different parts of Brighton are found to vary so much in temperature, in proportion as they are, more or less sheltered from, or exposed to, their influence. The King's Road, and the districts of the town between it and the Western Road throughout their whole extent, the Old Steine, Grand Parade and neighbourhood, are the warmest; the eastern, north-eastern, and the elevated parts of the Montpelier district, are the coldest, during the prevalence of these winds.

During the coldest winter days, when the sun is unobscured by clouds, the valley of the King's Road and central portions of

the Marine Parade are remarkably mild and pleasant, and form a striking contrast to the elevated and exposed parts of the town. Mr Cresy* observes, "When in the winter the wind blows from the north, the inhabitants of the higher portions of the town may suffer extreme cold, whilst on the Marine Parade, or in the valley of the King's Road, there is a perfectly genial air."

I may here take the opportunity of remarking, that Brighton being much exposed to the winds from all quarters, and being consequently remarkably well ventilated, and being also, owing to the porous nature of the soil, and the declivity of its surface, exceedingly free from damp and moisture, there is not the same advantage in the choice of elevated situations that there is in other towns differently circumstanced. I do not see that they possess any natural salubrity over the rest of the town; while their exposure to the cold winds during the winter and spring, renders them very trying to all but the strongest constitutions, and perfectly unsuited to all persons subject to inflammatory affections of the lungs. Many a severe cold and inflammatory attack has been caught, particularly by children, who, after playing and taking exercise on the front walks and esplanades, and in the heated and perspiring condition of the body, have been exposed to the cold, biting, north-east wind on their way home. The only

* Report to the General Board of Health, p. 5.

advantage these situations possess over the rest of the town is, that being farther removed from the sea, the air is better suited to those constitutions, with whom the more strongly impregnated saline air of the cliffs does not agree.

After the south-west and north east winds, those from the east and south-east come next in frequency, but they do not blow on the average oftener than four days in the month. They are generally cold winds during the winter and early spring, for though they come from the sea, they are not really sea-winds, as they merely pass over the English channel from the continent of Europe, where the cold, at this time of the year, is much greater than it is in this country; and the extent of sea-surface which they traverse, is not sufficient materially to affect their temperature. But the idea that the easterly winds are colder at Brighton than at other places, always excepting the exposed parts of the town formerly mentioned, is a mistake.

It has been already stated, that the annual fall of rain is less at Brighton than in other parts of the adjoining country. The following table shows the mean fall of rain during the winter months in Brighton and other places, according to the returns formerly mentioned.
(p. 45.)

| | DECEMBER. | | JANUARY. | | FEBRUARY. |
|------------------|-----------|-------|----------|-------|-----------|
| | IN. | | IN. | | IN. |
| Brighton..... | 1.6 | ..... | 2.2 | ..... | 0.9 |
| Uckfield | 2.3 | ..... | 3.3 | ..... | 1.0 |
| Chichester | 1.8 | ..... | 2.8 | ..... | 1.1 |

| | DECEMBER. IN. | | JANUARY. IN. | | FEBRUARY. IN. |
|-----------------|------------------|-------|-----------------|-------|------------------|
| Glynde | 2.3 | ..... | 3.2 | ..... | 1.3 |
| Buxted Park ... | 2.4 | ..... | 3.4 | ..... | 1.1 |
| Hastings..... | 2.0 | ..... | 2.6 | ..... | 1.2 |
| Greenwich | 1.2 | ..... | 2.3 | ..... | 0.9 |

It is to the diminished amount of the fall of rain, the great porosity of the soil, the declivity of the surface sloping towards the sea, from which the moisture rapidly runs off, and dries up after rain, together with the remarkable absence of decaying vegetable matters, that the great comparative dryness of the air of Brighton during the winter, as contrasted with other places in England, is owing. Land-fogs, therefore, are very uncommon at Brighton, and the morning and evening mists are dissipated earlier, and return later, than is usually the case in this climate.

In damp weather, and when there is not much air stirring, the smoke during the winter often collects and hangs over the town like a dense cloud, and is often mistaken for fog; but that it is not so, anyone may be easily convinced by going a little beyond the region of smoke in the outskirts of the town, where the air will be found to be quite clear. When the wind blows from the land side, a concentration of smoke takes place along the front walks and drives, and extends for a considerable distance over the sea, quite obscuring the beauty of the sea view. When the wind comes from the sea, this state of things is reversed: the front part of the town

is quite clear, while the northern portions are often enveloped in a dense cloud of smoke. "It has been observed," says Mr Cresy, "that when there is a fresh breeze from the south, or south-west, all that part of the town contiguous to the sea, enjoys an almost Italian sky, whilst the northern portions are dull and dark."*

This evil of late years has increased very much with the rapidly increasing size of the town. And, though it is really a question whether the smoke (which, in point of fact, is only small particles of unconsumed charcoal) may not serve rather as a purifier of the atmosphere of a large city, than the reverse, by absorbing the deleterious gases, (a well-known property of carbonaceous matter,) there are few who would be inclined to view it in this light, destroying, as it does, the clearness of the atmosphere and the beauty of the sea-view, not to mention the destruction it causes to furniture and delicate articles of dress, no inconsiderable inconvenience to a place like Brighton. In London and some other places, the manufacturers are compelled, by Act of Parliament, to consume their own smoke; and, whatever may be said to the contrary by interested parties, there is no doubt that the atmosphere of London is clearer than it was before the Act was introduced, and much more so than it could possibly be at

* Report on Brighton (p. 5).

the present time, with its increased population and extent, if no Act of the kind existed. It has often appeared to me an anomaly, in a place like Brighton, whose prosperity depends upon the clearness and purity of the air, but where dense volumes of smoke, which would astonish an inhabitant of London, may be seen constantly issuing from the tall chimneys which here and there dot the town, and some in the neighbourhood of the fashionable parts, that a similar measure has never been introduced, or, I believe, ever seriously contemplated. In the meantime, the nuisance is rapidly increasing, and will, I fear, if not remedied, at no very distant period do considerable mischief to the interests of the place; for there is nothing people, especially those who come for health and amusement, dislike more at the sea-side than a thick smoky atmosphere, and many may be naturally tempted to go to other and smaller places, where the air is brighter and clearer.

The mildness, and particularly the equableness of the temperature, the remarkable dryness of the atmosphere, and its freedom from all malarious exhalations, together with the choice it offers in the difference of temperature, between its sheltered and exposed situations, all combine in rendering Brighton a very desirable place of residence during the winter months; and suitable in the great majority of diseases for which sea air is found to be serviceable. To define the winter climate of

Brighton, in a few words, I should use the terms, *mild, equable, dry, and bracing*: though in this latter quality, it varies considerably in its different situations. I should say that the more sheltered parts of Brighton cannot differ very materially, in the general properties of their climate, from some of the more elevated portions of Ventnor.

The sea-side places on the south-west coast, as Torquay, and Penzance, owing to their more westerly position, have both a milder and more equable winter climate than Brighton, or than any other place on the south coast; but they are at the same time more relaxing, enervating, and humid: qualities of climate which certainly agree better with some constitutions, and are particularly well suited for a large class of pulmonary complaints. But the impression is certainly now rapidly gaining ground, that the drier, and more bracing climates of the south coast, are, on the whole, more conducive to health, as well as more suitable to the great majority of invalids, including many chest affections, and even some forms of pulmonary consumption, for which not long since the south-west climates were invariably prescribed. These questions, however, will come under consideration in a subsequent part of the work.

METEOROLOGICAL TABLE FOR MARCH, 1858.

| TABLE, No. 5. | | | | | | | | | | | | | | | | | | | |
|--|--|----------|---------|--------|-----------------|----------------|--------------|-------------------------|-------------------|--------------------|--------------------------|----------|-------------------|-------------|-----------------|-----------------|-------------|--------------|---------|
| Col. | | Highest. | Lowest. | Range. | Mean | | | | | | Sea. | | Winds, direction. | | | | Rain. | | |
| | | 1. | 2. | 3. | Of all Highest. | Of all Lowest. | Daily range. | Temperature of the air. | At 9 o'clock a.m. | At 12 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and East. | South and East. | North West. | No. of days. | Amount. |
| Brighton: | | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | 14. | 15. | 16. | 17. | 18. | 19. |
| West Cliff,—Dr. Keblell. | | 50 | 26 | 30 | 46.2 | 37.4 | 8.8 | 40.8 | 41.5 | 44 | ° | ° | ° | 11 | 8 | 8 | 2 | 11 | In. |
| Kemp Town,—J. O. N. Rutter, Esq. | | 57 | 25 | 32 | 40.4 | 35.9 | 10.5 | 40.1 | 42.8 | 45.6 | 70 | 46 | 38 | | | | | | 1.4 |
| North Central,—“Brighton Herald.” | | 63 | 24 | 39 | 48.5 | 37.1 | 11.4 | 41.8 | | | | | | | | | | | |
| Montpelier Dist.—J. A. Hingeston, Esq. | | 55 | 23 | 32 | 45 | 34.4 | 10.6 | 38.7 | | | | | | | | | | | |
| Ditto,—H. C. Malden, Esq. | | 55 | 24 | 31 | 44.2 | 35.6 | 8.6 | 39 | 40 | 42.8 | | | | | | | | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | | 68.7 | 23.6 | 45.1 | 50.7 | 33.6 | 17.1 | 41.1 | | | | | | | | | | 8 | 0.9 |
| Hyde Park,—Mr H. Williams. | | 23 | | | 33.4 | | | | 40.2 | 45.8 | 86 | | | | | | | 0 | 1.2 |
| Uckfield,—C. L. Prince, Esq. | | 71.8 | 21.4 | 50.4 | 52.0 | 32.3 | 19.7 | 41.1 | | | | | | | | | | 10 | 0.8 |
| Nottingham | | 69.5 | 16.5 | 53 | 53.7 | 32.7 | 21 | 42.2 | | | | | | | | | | 12 | 0.3 |
| York | | 64 | 18.5 | 45.5 | 46.7 | 33.3 | 13.4 | 39 | | | | | | | | | | 12 | 0.3 |
| Gloucester | | 69 | 14.5 | 54.5 | 50.7 | 33.4 | 17.3 | 41 | | | | | | | | | | 12 | 0.8 |
| COAST DISTRICTS. | | | | | | | | | | | | | | | | | | | |
| Torquay. | | 59 | 27 | 32 | 48.2 | 39 | 9.2 | 42.0 | | | | | | | | | | 12 | 0.8 |
| Venstor. | | 64 | 27 | 37 | 49.6 | 38.7 | 10.9 | 43.1 | | | | | | | | | | 9 | 1.3 |
| Worthing | | 59.6 | 23.7 | 30.9 | 40.8 | 35.1 | 9.7 | 40 | | | | | | | | | | 6 | 0.6 |
| Ryde | | 72 | 25 | 47 | 53.5 | 32.6 | 20.8 | 42 | | | | | | | | | | 8 | 1.0 |
| Col. | | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. |

METEOROLOGICAL TABLE FOR APRIL, 1858.

| TABLE, No. 6. | Col. | Highest. | Lowest. | Range. | Mean | | | | | | | | Sea. | | Winds, direction. | | | | Rain. | |
|--|------|----------|---------|--------|-----------------|----------------|--------------|---------------------|-------------------|---------------|-------------------|--------------------------|----------|---------|-------------------|-----------------------|-------------|-------------|-------|---------|
| | | | | | Of all Highest. | Of all Lowest. | Daily range. | Temperature of air. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and South East. | North West. | No. of days | | Amount. |
| | | | | | | | | | | | | | | | | | | | | |
| BRIGHTON : | | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebell..... | 69 | 31.4 | 37.6 | 55.1 | 43.2 | 11.9 | 47.7 | 48.7 | 52.1 | 53.9 | ° | ° | ° | ° | 14. | 15. | 16. | 17. | 18. | 19. |
| Kemp Town,—J. O. N. Rutter, Esq. . . . | 68 | 30 | 38 | 55.4 | 41.5 | 13.9 | 47 | 49 | 54.6 | 46 | ° | ° | ° | ° | 9 | 11 | 10 | 1 | 11 | In. |
| North Central, "Brighton Herald" | 71 | 29 | 42 | 56.3 | 43.6 | 12.7 | 48.5 | | | | | | | | | | | | | 4.4 |
| Montpelier Dist.—J. A. Hingeston, Esq. . | 63 | 29 | 34 | 51 | 40.7 | 10.3 | 44.4 | | | | | | | | | | | | | |
| Ditto,—H. C. Malden, Esq..... | 65 | 29 | 36 | 53.3 | 41.3 | 11.7 | 46 | 47.8 | 50.5 | 51.7 | | | | | | | | | | |
| INLAND DISTRICTS : | | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | 76 | 27.2 | 48.8 | 57.6 | 38 | 19.6 | 46.4 | 47.8 | 53.9 | | | 87 | | | | | | | 11 | 2.4 |
| Hyde Park,—Mr H. Williams. | 22 | 26 | 47 | 58 | 39.5 | 18.5 | 47.2 | | | | | | | | | | | | 11 | 2.1 |
| Uckfield,—C. L. Prince, Esq. | 73 | 26 | 56 | 56 | 36 | 20.4 | 45 | | | | | | | | | | | | 10 | 2.4 |
| Nottingham | 79 | 23 | 56 | 56 | 36 | 20.4 | 45 | | | | | | | | | | | | 7 | 1.2 |
| York | 70 | 28 | 42 | 54.1 | 37.7 | 16.4 | 44.5 | | | | | | | | | | | | 15 | 2.7 |
| Gloucester | 75 | 25 | 50 | 57 | 38.2 | 19.2 | 46.4 | | | | | | | | | | | | | |
| COAST DISTRICTS : | | | | | | | | | | | | | | | | | | | | |
| Torquay | 61 | 34 | 27 | 53.8 | 44.1 | 9.7 | 47.6 | | | | | | | | | | | | 16 | 4.1 |
| Venstor | 66 | 32 | 34 | 55.1 | 44.5 | 10.6 | 48.4 | | | | | | | | | | | | 12 | 2.9 |
| Worthing | 64.4 | 32.8 | 31.6 | 54.1 | 42 | 12.1 | 46.6 | | | | | | | | | | | | 11 | 2.5 |
| Osborne | 69.2 | 30.8 | 38.4 | 55.1 | 39.4 | 15.7 | 45.8 | | | | | | | | | | | | 10 | 2.2 |
| Col. | | | | | | | | | | | | | | | | | | | | |
| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | |

METEOROLOGICAL TABLE FOR MAY, 1858.

| TABLE, No. 7. | | | | | | | | | | | | | | | | | | | | |
|--|----------|---------|--------|-----------------|----------------|--------------|-------------------------|-------------------|---------------|-------------------|--------------------------|----------|---------|-------------------|-----------------------|-----------------|-------------|--------------|---------|--|
| Col. | Highest. | Lowest. | Range. | Mean | | | | | | | Maximum Rays of the Sun. | Sea. | | Winds, direction. | | | | Rain. | | |
| | | | | Of all Highest. | Of all Lowest. | Daily range. | Temperature of the air. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | | Highest. | Lowest. | South West. | North and North East. | South and East. | North West. | No. of days. | Amount. | |
| BRIGHTON: | | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebbell..... | 72 | 38 | 34 | 59.6 | 46.3 | 13 | 51.2 | 52.8 | 57.1 | 57.0 | 90 | ° | ° | 13. | 18. | 19. | In. | 1.7 | | |
| Kemp Town,—J. O. N. Rutter, Esq. | 72 | 36 | 36 | 60.1 | 46.3 | 13.8 | 51.5 | 50.2 | | | | | | 56 | 49 | 3 | 19 | 1.7 | | |
| North Central,—“Brighton Herald.” | 71 | 39 | 32 | 59.1 | 48.0 | 10.5 | 52.1 | | | | | | | | | | | | | |
| Montpelier Dist.—J. A. Hingeston, Esq. . . . | 68 | 33 | 35 | 59.9 | 43.9 | 16 | 50.2 | | | | 100 | | | | | | | | | |
| Ditto,—H. C. Malden, Esq. | 68 | 35 | 33 | 57.4 | 44.8 | 12.6 | 49.5 | 50.1 | 55.2 | 55.5 | | | | | | | 18 | 1.4 | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | 81.2 | 32.1 | 49.1 | 63.7 | 42.7 | 21 | 51.5 | | 55.1 | 59.1 | 81.7 | | | | | | 17 | 1.8 | | |
| Hyde Park,—Mr H. Williams. | 33 | 33 | | 43.6 | | | | | | | | | | | | | 17 | 2 | | |
| Uckfield,—G. L. Prince, Esq. | 80 | 31.6 | 48.4 | 61.1 | 42.2 | 18.9 | 50 | | | | 93 | | | | | | 12 | 1.4 | | |
| Nottingham. | 84 | 30.9 | 53.1 | 63.3 | 42.4 | 20.9 | 51.1 | | | | | | | | | | 20 | 1.7 | | |
| York. | 67.5 | 33 | 34.5 | 57.2 | 43.1 | 14.1 | 48.4 | | | | | | | | | | 17 | 2.7 | | |
| Gloucester. | 82 | 31.5 | 50.5 | 60.8 | 41.7 | 10.1 | 49.5 | | | | | | | | | | | | | |
| COAST DISTRICTS: | | | | | | | | | | | | | | | | | | | | |
| Torquay. | 67 | 39 | 28 | 58 | 47.6 | 10.4 | 51.1 | | | | | | | | | | 9 | 0.9 | | |
| Ventnor. | 71 | 39 | 32 | 58.5 | 47 | 11.5 | 51.1 | | | | | | | | | | 11 | 1.6 | | |
| Worthing. | 66.8 | 33.7 | 23.1 | 56.5 | 40.3 | 10.2 | 49.7 | | | | | | | | | | 8 | 0.9 | | |
| Osborne. | 78.4 | 36.7 | 41.7 | 60.2 | 42.5 | 17.7 | 49.6 | | | | 76.1 | | | | | | 11 | 1.6 | | |
| Col. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | |

METEOROLOGICAL TABLE,

Showing the monthly mean highest temperature by day; the monthly mean lowest temperature by night; the monthly mean daily range; and the mean temperature of the month; at Brighton and six other places during a period of five years from 1853 to 1857 inclusive, for the three spring months.

| TABLE No. 8. | MARCH. | | | | APRIL. | | | | MAY. | | | |
|------------------|----------|---------|--------|--------------------------------|----------|---------|--------|--------------------------------|----------|---------|--------|--------------------------------|
| | Highest. | Lowest. | Range. | Mean temperature of the month. | Highest. | Lowest. | Range. | Mean temperature of the month. | Highest. | Lowest. | Range. | Mean temperature of the month. |
| Brighton | 47.2 | 36.1 | 11.1 | 40.7 | 52.2 | 41.4 | 13.8 | 46.8 | 60.5 | 45.6 | 14.9 | 51.8 |
| Greenwich | 48.8 | 33.5 | 15.3 | 40.1 | 57.3 | 38.4 | 18.9 | 46.3 | 62.6 | 42.3 | 20.3 | 50.7 |
| Nottingham | | | | | 56.4 | 37 | 19.4 | 45.2 | 60.6 | 42.1 | 18.5 | 49.6 |
| Uckfield | 50 | 32.4 | 17.6 | 40.2 | 58.4 | 37.7 | 20.7 | 46.5 | 63.6 | 41.2 | 22.4 | 50.7 |
| Ventnor | 48.5 | 38.2 | 10.3 | 42.7 | 54.3 | 43.2 | 11.1 | 47.2 | 58 | 46.8 | 11.2 | 49.7 |
| Worthing | 45.8 | 35.1 | 10.7 | 39.4 | 52.6 | 40.5 | 12.1 | 45 | 57.6 | 45.3 | 12.3 | 49.7 |
| Ryde | 50.6 | 38.6 | 17 | 41.1 | 59.7 | 39.5 | 20.2 | 48.1 | 64.1 | 43.5 | 20.6 | 52.1 |

SPRING.

MARCH, APRIL, MAY.

9.—*Ungenial nature of the English Climate during the Spring Months. The effect of the Sea upon the Climate of Coasts during this period of the year. The Day Temperature colder than that of Inland Districts. The Spring Climate of Brighton considered. Fall of Rain. The direction of the Winds. The warmth of the front walks and Esplanades in clear weather. The great dryness of the Brighton Air during the Spring. Its comparison with other Sea-side places.*

The spring months are undoubtedly the most unpleasant portion of the English climate. The other three seasons of the year in England are mild and genial. Though the atmosphere be damp, and subject to sudden daily changes, and fogs prevail during the autumn and winter, yet the summer and winter seasons are free from those extremes of heat and cold which distinguish continental climates, and which are so trying and depressing to all the vital energies. But the spring in England is slow in accession; dry, harsh, and irritating; and liable to comparatively severe and sudden changes of temperature. The north, north-

east, and easterly winds prevail during the greatest part of the time; which, together with a hot sun and an unclouded sky, render the climate very trying to delicate persons and invalids, particularly those subject to pulmonary complaints. Though the sun acquires considerable power towards the end of the season, yet, owing to the cold biting north-east winds, the mornings, evenings, and nights are very cold and chilling; and severe frosts are common as late as May or even June, which in the course of a single night not unfrequently clear our nursery gardens of an abundant promise of fruit. This year (1858), as late as the night of the 13th of April, the thermometer in Hyde Park sunk to 22° : ten degrees below freezing point; and at Greenwich, on the 5th, 7th, and 8th of May, it was respectively $33^{\circ}.4$, 32.1 , and 32.7 , with a range of temperature between the highest by day and lowest at night, of from twenty-six to thirty degrees. The mean minimum night temperature at Greenwich in March was only two degrees, and in April only six degrees, above that of January of the same year. These cold winds are the most severely felt along the eastern coasts and districts of the country, and as a general rule, become milder towards the west and south-western districts.

It must not, however, be supposed that England is the only country which suffers from cold winds during the spring. Sir

James Clarke says of the south-east of France, "The whole of this tract of country is subject also to keen, cold, northerly winds, especially the *mistral*, which prevails during the winter and spring, and is most injurious in pulmonary diseases;"* and in his description of the climate of Nice, when alluding to "the sharp, chilling, easterly winds" which prevail there during the months of March and April, and form the greatest objection to the climate, being the worst enemy the pulmonary invalid has to contend with, observes, "It must not be supposed, however, that these sharp spring winds are peculiar to Nice. They prevail more or less over the whole south of Europe. They are equally bad at Naples; somewhat softened at Pisa; and still more so, perhaps, at Rome."†

It is interesting to observe the effect of the sea upon adjoining coasts at this season of the year, and the uniformity of the results, in respect of the relative temperatures of sea and inland places, as recorded in the meteorological tables (Nos. 4, 5, 6, and 7) shows the general accuracy of the observations. The sea reached its lowest point, 38° , on the 19th of February. It remained at about this temperature until the middle of March, when owing to the increasing strength of the sun's rays it became slightly warmer, and on the 24th of the month reached 46° ; after which, owing to the prevalence of cold winds it be-

* Clarke on Climate, p. 202.

† Ditto, p. 211,

came two degrees colder, and continued so until the middle of April. After this, it gained heat more quickly; and at the end of April was as high as 50° , where it again remained nearly stationary for about three weeks, when towards the latter end of May, owing to the prevalence of the south-west winds, and a considerable fall of rain, it rose in the course of a few days to 56° . The mean temperature of the sea for the three months, was respectively $41^{\circ}.5$, 46° , and $52^{\circ}.5$. During the winter three months we have seen that the mean temperature of the sea, was as high as the mean *day-maximum*, and in December was slightly above it. But at this season of the year it corresponds very closely with the *mean temperature of the air*, which at Greenwich was for the same three months, respectively, $41^{\circ}.1$, $46^{\circ}.4$, and $51^{\circ}.5$. This was about ten degrees *colder* than the *mean day-maximum* of inland districts, which at Greenwich for the three spring months was respectively $50^{\circ}.7$, $57^{\circ}.6$, and $63^{\circ}.7$.

It has been before explained, that the sea follows the changes of the season much more slowly than the land. During the winter the sea is the warmest; but in the spring of the year the land acquires warmth from the increasing power of the sun more rapidly than the sea, and becomes consequently warmer than it, and remains so throughout the summer. The general effect, therefore, of the sea upon adjoining coasts during the spring and summer is to lower the tempera-

ture of the atmosphere; while during the autumn and winter it has the opposite effect. The difference between the mean temperature of the sea, and the mean day-maximum of inland situations, amounts during the spring to about ten degrees. The effect, therefore, of the sea upon the day-temperature must be considerable; and we find accordingly, that with the exception of Ryde, which from its position has an inland climate, the mean day maximum of the sea-side places is lower than that of inland districts, with the exception of York (see col. 4), which is colder from its more northern position. The mean maximum day-temperature of the western portion of Brighton from being nearly the same as at Greenwich during February, becomes four and a half degrees colder in March, two and a half in April, and four in May. The average of five years (see table 8) gives a somewhat relatively higher temperature for Brighton, owing probably to the position from which the observations were taken being further from the sea. The south-west coast does not appear to enjoy any advantage over the south coast, in respect of its day-temperature, at this season of the year; but suffers in like manner from the cooling effects of the sea (see Torquay tables 6 and 7). The *mean* temperature of Penzance from being five degrees warmer than London during the winter, is scarcely one degree warmer in the spring. Its *maximum* day-temperature therefore is doubtless several degrees colder than that of London.

We find, also, that for the first time, it is warmer by nearly two degrees in March in Hyde Park, at twelve o'clock, than it is at Brighton at the same hour; while at nine a.m. it still continues colder at Hyde Park, though by only one degree. For April the results are about the same; but during May, as the sun increases in power, and its effects are felt earlier in the day, Hyde Park becomes the warmest at nine o'clock by about two degrees, and remains so throughout the day.

But though the sea is sufficiently cold to lower materially the day-temperature of coasts during the spring; it is considerably warmer than the *mean night-minimum* temperature (see col. 5), which at Greenwich is from eight to ten degrees *colder* than the sea. The influence of the sea, therefore, as at other periods of the year, is to moderate the temperature at night. Last year the mean night-minimum temperature in the sheltered parts of Brighton was about three and a half degrees warmer in March, five in April, and three and a half in May, than at Greenwich. The average of five years gives about three degrees of warmth for each month in favour of Brighton.

Thus though at this season of the year the days are colder from the vicinity of the sea, the nights are rendered warmer; and the range of temperature consequently (see col. 6) considerably diminished; so that they still maintain their advantage in point of equableness of temperature; both as respects the difference between the day-

maximum and night-minimum, as well as in the successive daily ranges.

The climate of Brighton during the spring of the year, is far from standing high in popular estimation; but all the meteorological observations which have hitherto been made upon it go to disprove the idea, that, with the exception of the more exposed situations, it is inferior to other places along the same coast; while there is every reason to believe that the parts of the town situated in the valley of the King's Road, and some of the central portions, which are much sheltered from the north-east winds, enjoy both a steadier and milder climate at this season of the year, than the majority of sea-side places. The impression of the severity of a spring climate of Brighton has doubtless, in a great measure, been derived from the following observations of Sir James Clarke:—"In the spring, on the other hand, owing to its (Brighton) exposure to the north-easterly winds, the climate is cold, harsh, and irritating to delicate constitutions." But this remark I conclude is meant to apply to the east-cliff, as he previously on the same page says, "that the true character of the Brighton climate belongs in strictness to the parts of the town east of the Steyne; here the air is eminently dry and bracing."* The author, however, does not produce the results of any meteorological observations in proof of

* Clarke on Climate, p. 129.

the above statement ; neither has he resided, that I am aware of, a sufficient length of time in the town to enable him to form any opinion on the climate from his own observations ; and I am therefore at a loss to understand upon what data his statement is founded. But at the same time, if he intended the observations to apply only to the coldest parts of the town, though I think even in that case, the expressions used are too strong, it must be admitted that there is much truth in what he says. But the public generally, who are not very discriminating in these matters are wont to apply Sir James Clarke's remarks to the whole of Brighton, which I can hardly think is his intention, as he says only a few lines previously, that to the "westward" the air of Brighton is "milder." * * * "Delicate, nervous invalids are very sensible of this difference, and generally feel better in the western part."

The different parts of Brighton, in proportion as they are more or less exposed or sheltered, doubtless differ in climate during the spring more than at any other period of the year ; and hence the great discrepancy in the accounts and opinions of the spring climate of the place.

Though a much larger series of meteorological observations, than I am at present able to produce, would be necessary in order to arrive at any satisfactory conclusion as to the exact relative properties of the climate

of the different parts of the town, the observations recorded in the foregoing tables are sufficient to show that the elevated and exposed spots, particularly at night, are considerably colder than those which are sheltered from the cold winds by the rising downs behind. Mr Hingeston's and Mr Malden's observations show a mean night-temperature of from two to three degrees colder than the west cliff; and differing very little from the minimum temperature at Greenwich and Hyde Park. The maximum day temperature, and also the temperature at the three other periods of the day—9 a.m., 12 o'clock, and 3 p.m.,—recorded in Mr. Malden's observations, average about two degrees below those of the west-cliff. Mr Rutter's observations show about the same maximum temperature, but the nights during March and April are colder; and it would appear also that, though the temperature is about the same as on the west-cliff, up to one o'clock, it is considerably colder at three o'clock in the afternoon, which is accounted for probably by the larger mass of buildings, at the west end, which give out, in the after-part of the day, the heat which they had previously absorbed from the sun's rays. But, as before observed, it must be borne in mind that it is not so much the actual lower temperature of the air of these elevated and exposed spots which makes them appear so much colder than the sheltered situations, as the more circulating and moving condition of

the atmosphere: the draughts and currents from the downs, which so rapidly carry off the heat of the body, and in a proportionate extent, acutely affect the bodily feelings.

The fall of rain at Brighton and Greenwich, and several places in Sussex, during the spring months, according to the returns formerly mentioned, is as follows:—

| | MARCH. IN. | | APRIL. IN. | | MAY. IN. |
|------------------|---------------|-------|---------------|-------|-------------|
| Brighton..... | 1.1 | ..... | 1.7 | ..... | 1.9 |
| Uckfield | 1.8 | ..... | 2.1 | ..... | 2.6 |
| Chichester | 1.6 | ..... | 1.8 | ..... | 2.6 |
| Glynde | 1.6 | ..... | 1.9 | ..... | 2.2 |
| Buxted Park ... | 1.7 | ..... | 2.1 | ..... | 2.5 |
| Hastings..... | 1.6 | ..... | 2.3 | ..... | 2.4 |
| Greenwich | 1.0 | ..... | 1.4 | ..... | 2.0 |

The mean direction of the winds on the average of six years, from 1853 to 1858, was:—

| | South-West. | | North-East. | | South-East and East. | | Other directions. | | Days. |
|------------|-------------|-----|-------------|-----|-------------------------|-----|----------------------|--|-------|
| March | 10 | ... | 13 | ... | 6 | ... | 2 | | 31 |
| April..... | 10 | ... | 12 | ... | 6 | ... | 2 | | 30 |
| May | 12 | | 12 | ... | 5 | ... | 2 | | 31 |

The north-east winds having become the most prevalent after December, maintain their ascendancy throughout the spring months. They are severely felt along the east and north-eastern outskirts, and other elevated and exposed situations, particularly those of the Montpelier district; but the low level of the King's Road, and neighbouring districts below the Western Road, the valley

of the Old Steine and Grand Parade, are considerably sheltered from them, both by the rising hills behind and the mass of buildings to the eastward. The south-west winds, it will be observed, blow on the average about ten days in the month, but owing to the coldness of the surface of the water over which they come, and from which they derive their temperature, they have not that pleasant softness which they possess at other periods of the year; but, on the contrary, are generally cold and chilling to the feelings, especially during March and April, after which, owing to the rise in the temperature of the sea, they become warmer and more pleasant.

What, then, are the conclusions to be drawn, from the foregoing observations, of the general properties of the Brighton climate during the spring months? This question may be considered in two points of view; firstly, as contrasted with other sea-side places; secondly, as compared with inland districts.

As regards the latter, I think it must be acknowledged by even the greatest admirers of the sea-side, that inland situations, all things considered, have certainly the advantage over those on the coast at this season of the year. I do not mean all inland places indiscriminately, but dry, open, elevated, or undulating spots, with a gravelly or chalky porous soil; and with no marsh-land or other well-known source of disease sufficiently near

to affect the salubrity of the atmosphere. There can be no question, that the air of such places, during the day, is warmer, softer, more pleasant to the feelings, better adapted to the majority of invalids, especially consumptive persons, or those in which any predisposition to the complaint exists; as well as in all inflammatory affections of the lungs, (bronchitis, pleurisy, pneumonia, &c.), and those persons who have any unusual predisposition to coughs and colds. Up to about the end of February, or beginning of March, I am persuaded that the air of Brighton, as a general rule, is superior to that of inland districts. The mornings, and afternoons, as well as the nights, up to this period of the year, are warmer on the coast; but after this month, the day temperature sinks very perceptibly below that of situations further removed from the sea. At this time, therefore, all persons suffering in the manner above indicated, ought to remove to some healthy inland district, where they will be able to take out-door exercise with fewer impediments from the weather, and with less risk, than at the sea-side. Not that I mean to infer, from these observations, that there is anything actually unhealthy in the climate of Brighton at this season of the year, or that even many invalids, free from the most complaints, with whom the sea air agrees, may not reside here with decided advantage. The elevated portions of the town are doubtless cold and unpleasant in the

spring, but the valley of the King's Road, from the Old Steine to Adelaide Crescent, and the parts between it and the Western Road, the Old Steine district, as well as the more central portions of the Marine Parade, afford a warmer and steadier climate, and here all but the most sensitive and delicate may reside with every comfort.

The front parts of the town, close to the houses in sunny weather, at this time of the year acquire great heat, by reflection and radiation of the sun's rays from the houses and pavement, producing quite an artificial climate, which for warmth, and often clearness of the atmosphere, is equal to any the country can produce; and which, were it not for the cold draughts which blow down the side streets leading to the beach, would be unrivalled. The contrast between these side-currents of air and the warmer atmosphere of the front, is often very great, and when the body is heated from exercise in the latter, the sudden impression of cold from the side currents, in the case of the sensitive and delicate, is not free from danger. The best plan to avoid this inconvenience is by walking up and down some part (and many such may be found) which is free from any side opening, and returning home either in a chair or close fly. I have known much mischief arise from the neglect of this precaution.

That Brighton is not so unpleasant in the spring as many are led to believe, is evident

from the fact, that the residents do not generally leave the place for change until later in the year, when the delights of a country life, or the desire for travelling, calls them away; for though the days are colder, the nights are warmer, and the range of temperature consequently less, than in inland districts, which to some is a great advantage. The air likewise is remarkably dry at this season of the year, and possesses another great advantage in being entirely free from all malarious exhalations, which in low-lying marshy districts in the spring are so productive of agues and remittent fevers. In the course of many years' experience in our large public institutions, the Dispensary, and subsequently the Hospital, I have never met with a single decided case of ague that had its origin in the town, while the most unpromising cases, which had previously resisted all treatment, invariably improve rapidly on breathing the pure and bracing air of our cliffs.

The comparison of Brighton with other sea-side places on the same coast requires a few words of explanation. The general impression doubtless is, that Brighton is colder during the spring than the generality of places along the same coast. But in giving my opinion on this subject, it is necessary to discriminate between the different parts of Brighton, otherwise the comparison can have no definite meaning. If the exposed and elevated portions of the town only be meant, it must be admitted that the opinion

mentioned above is probably correct. The results of Mr Hingeston's and Mr Malden's observations, and also Mr Rutter's as respects the night temperature, show a lower temperature than those of any sea-side place from which returns have been received. The more elevated position of these districts, and their exposure to currents of cold air from the downs, are quite sufficient to account for the greater coldness of climate. But the comparison of other sea-side places with the western, and more sheltered parts in the centre of Brighton, give a different result. The returns for last spring, 1858 (see tables 5, 6, and 7,) show a somewhat higher temperature, both maximum and minimum than Worthing (occasioned probably, not so much by any difference in the actual climate of the two places, as by the greater mass of buildings of the former), and a lower temperature by about two degrees than Torquay, which would be accounted for chiefly by its more westerly position.

The returns from Hastings in the Quarterly Reports are very irregular, but all which have been published, shew a lower temperature during the spring than at Brighton, at least as compared with the central parts of the town. Last spring (1858) there were no returns from Hastings, so that I have had no opportunity of comparing them with my own observations of the western division of Brighton. The idea of Hastings being colder than Brighton during the spring is quite contrary to

all preconceived opinions generally entertained on the subject; yet, I have no doubt, that this is actually the case as respects the *general* atmospheres of the two places: for as a general rule the air becomes colder and keener, during the spring of the year, as the east coast is approached, and Hastings is forty miles east of Brighton. But at the same time there can be no question, that the peculiar configuration of the hills which rise nearly perpendicularly behind the town of Hastings, by the extensive shelter they afford from the cold winds, give to this portion of the place a peculiar climate, and one which differs most materially from the less sheltered situations to the westward. The shelter derived from the hills at Brighton, which rise gradually behind the town is slight, compared with that which Hastings derives from its nearly perpendicular cliffs; and though the surrounding atmosphere may be colder at Hastings, there can be no question that the sheltered parts have considerably the advantage over any portion of Brighton; not only probably in a somewhat higher temperature of the air, but more particularly in the greater feeling of warmth, owing to the more confined and less moving condition of the atmosphere. From this circumstance Hastings unquestionably, at this season of the year, is the more suited to the generality of pulmonary disorders, and for delicate, sensitive persons, who require shelter from the north-east and

easterly winds. But owing to the extent to which it is hemmed in by the surrounding steep hills, the air is closer and more decidedly marine than at Brighton, which renders it less desirable as a place of residence in all complaints which have their origin in debility, and general atony of the system. Ventnor would seem to enjoy more repute as a spring residence for invalids than any other place on the south-coast; and it is not unlikely that the shelter afforded from the north-east winds, by the lofty range of hills which encircle it on the land side, may give it, at this season of the year, some advantages over other places. But at the same time it cannot be exempt from the chilling effects caused by the low temperature of the sea, which all sea-side places suffer from during March, April, and part of May. In comparing the meteorological returns of Ventnor with other places, allowance must be made for the circumstances under which the observations for Ventnor were taken (see p. 57). Increasing experience will, I have no doubt, sooner or later, reveal the real climate of all coast places during the spring, and cause them to be generally avoided by the sensitive and delicate. Dr. Martin himself, judging at least from the following remark, does not appear to entertain a very high opinion of the spring climate at Ventnor: "It may here be remarked," he says, "That we have no good *spring climate* in Britain, *whatever may be said or written to the contrary.*"*

* The Undercliff, Isle of Wight, by Dr. Martin, p. 139.

METEOROLOGICAL TABLE FOR JUNE, 1858.

| TABLE, No. 9. | Col. | Highest. | Lowest. | Range. | Mean | | | | | | | | Sea. | | Winds, direction. | | | | Rain. | |
|--------------------------------------|------|----------|---------|--------|-----------------|----------------|--------------|-------------------------|-------------------|--------------------|-------------------|--------------------------|----------|---------|-------------------|-------------|-----------------|-------------|--------------|---------|
| | | | | | Of all Highest. | Of all Lowest. | Daily range. | Temperature of the air. | At 9 o'clock a.m. | At 12 o'clock p.m. | At 3 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North East. | South and East. | North West. | No. of days. | Amount. |
| | | | | | | | | | | | | | | | | | | | | |
| Brighton: | | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebbell..... | | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | In. |
| Kemp Town,—J. O. N. Rutter, Esq.... | 86 | 49 | 37 | ° | 72.8 | 56.5 | 16.3 | 63 | 64.7 | 69.5 | 70.9 | 104 | 63.5 | 59 | 16 | 6 | 6 | 1 | 5 | 0.2 |
| North Central,—“Brighton Herald.”... | 86 | 52 | 34 | ° | 73.2 | 55.4 | 17.8 | 62.6 | 65.7 | 68.7 | | 98 | | | | | | | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | 94.5 | 45.3 | 49.2 | 79.5 | 53.9 | 25.6 | 65 | | 68.8 | 75.6 | | | | | | | | | 5 | 1.2 |
| Hyde Park,—Mr H. Williams. | 45 | 43 | 46.4 | 75.4 | 54.1 | | 62 | | | | | | | | | | | | 8 | 0.2 |
| Uckfield,—C. L. Prince, Esq..... | 90 | 39.5 | 52.7 | 78 | 51.7 | 26.3 | 63.1 | | | | | 91 | | | | | | | 5 | 1.3 |
| Nottingham | 92.2 | 40 | 45 | 71.1 | 51.6 | 19.5 | 59.6 | | | | | | | | | | | | 5 | 1.7 |
| York | 85 | 40 | 45 | 75.5 | 51.3 | 24.2 | 61.7 | | | | | | | | | | | | 5 | 1.3 |
| Gloucester | 90 | 45 | 45 | | | | | | | | | | | | | | | | 8 | 1.1 |
| COAST DISTRICTS. | | | | | | | | | | | | | | | | | | | | |
| Torquay | 77 | 45 | 32 | 70 | 54.7 | 15.3 | 60.6 | | | | | | | | | | | | 4 | 1.2 |
| Ventnor | 82 | 51 | 31 | 69.9 | 57.2 | 12.7 | 62 | | | | | | | | | | | | 4 | 0.6 |
| Worthing | 76 | 51.8 | 24.2 | 68.1 | 55.8 | 12.3 | 60.3 | | | | | 93.8 | | | | | | | 4 | 0.6 |
| Osborne | 88.2 | 49.1 | 39.1 | 73.7 | 52.5 | 21.2 | 61.4 | | | | | | | | | | | | 4 | 0.6 |
| Col. | | | | | | | | | | | | | | | | | | | | |
| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | |

METEOROLOGICAL TABLE FOR JULY, 1858.

| TABLE, No. 10. | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|----------|---------|--------|-----------------|----------------|--------------|---------------------|-------------------|---------------|-------------------|--------------------------|-------------------|---------|-------------|-----------------------|-----------------|-------------|--------------|---------|
| Col. | Highest. | Lowest. | Range. | Mean | | | | | | Sea. | | Winds, direction. | | | | Rain. | | | |
| | | | | Of all Highest. | Of all Lowest. | Daily range. | Temperature of air. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and North East. | South and East. | North West. | No. of days. | Amount. |
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | |
| BRIGHTON: | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebbell..... | 74 | 45 | 29 | 68.1 | 53.3 | 14.8 | 58.8 | 61.2 | 65.8 | 66.2 | 82 | 66 | 61.5 | 19 | 9 | 1 | 2 | 14 | 2.3 |
| Kemp Town,—J. O. N. Rutter, Esq. . . | 73 | 45 | 28 | 68.3 | 52.1 | 16.2 | 58.5 | 64.3 | | 66.9 | | | | | | | | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | 88.2 | 43.8 | 44.4 | 73.8 | 51.8 | 22.6 | 61 | 68.3 | 74.1 | | | | | | | | | 12 | 2.9 |
| Hyde Park,—Mr H. Williams. | 45.5 | 43 | 44 | 70.5 | 50.9 | 19.6 | 59.3 | | | | | | | | | | | 15 | 3.1 |
| Uckfield,—C. L. Prince, Esq. | 87 | 43 | 44 | 73.1 | 48.8 | 24.3 | 58.5 | | | | | | | | | | | 11 | 1.2 |
| Nottingham. | 86.8 | 38.8 | 48 | 73.1 | 48.8 | 24.3 | 58.5 | | | | | | | | | | | 9 | 2.6 |
| York. | 71 | 41.5 | 29.5 | 64.8 | 49.6 | 15.2 | 55.3 | | | | | | | | | | | 12 | 3.1 |
| COAST DISTRICTS: | | | | | | | | | | | | | | | | | | | |
| Ventnor. | 73 | 50 | 23 | 66.5 | 55.2 | 11.3 | 59 | | | | | | | | | | | 10 | 2.1 |
| Worthing. | 71 | 46 | 25 | 67.7 | 54.5 | 13.2 | 59.2 | | | | | | | | | | | 11 | 2.8 |
| Ryde. | 85 | 46 | 39 | 76.1 | 50.7 | 25.4 | 61.5 | | | | | | | | | | | | |
| Col. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |

METEOROLOGICAL TABLE FOR AUGUST, 1858.

| TABLE, No. 11. | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------|---------|--------|-----------------|----------------|--------------|-------------------------|-------------------|---------------|-------------------|--------------------------|----------|-------------------|-------------|-----------------|-----------------|-------------|--------------|---------|
| | Highest. | Lowest. | Range. | Mean | | | | | | | Sea. | | Winds, direction. | | | | Rain. | | |
| | | | | Of all Highest. | Of all Lowest. | Daily range. | Temperature of the air. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and East. | South and East. | North West. | No. of days. | Amount. |
| | | | | | | | | | | | | | | | | | | | |
| COL. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |
| BRIGHTON: | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebbell..... | 79.5 | 47 | 32.5 | 69.5 | 55.4 | 13.1 | 60.7 | 64.6 | 67.6 | 68.4 | 103 | 68 | 65.5 | 14 | 7 | 4 | 6 | 5 | 1.3 |
| Kemp Town,—J. O. N. Rutter, Esq. . . | 80 | 43 | 37 | 70.4 | 55.5 | 14.9 | 61.3 | 65.6 | 68.2 | | 93 | | | | | | | | |
| North Central,—“Brighton Herald.” . . | 80 | 40 | 31 | 69.7 | 57 | 12.7 | 61.6 | | | | | | | | | | | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | 86.9 | 43.3 | 43.6 | 75.6 | 52.1 | 23.5 | 62 | 67.9 | 74.7 | | | | | | | | | 8 | 1.6 |
| Hyde Park,—Mr H. Williams..... | 48 | 48 | 42.4 | 72.7 | 51.6 | 21.1 | 60.4 | | | | | | | | | | | 8 | 1.8 |
| Uckfield,—C. L. Prince, Esq..... | 84.4 | 42 | 50.7 | 74.4 | 50.9 | 23.5 | 60.7 | | | | | | | | | | | 19 | 3 |
| Nottingham..... | 90.5 | 39.8 | 50.7 | 74.4 | 50.9 | 23.5 | 60.7 | | | | | | | | | | | 13 | 3.4 |
| York..... | 76 | 44 | 32 | 66.7 | 51.6 | 15.1 | 57.2 | | | | | | | | | | | 12 | 1.6 |
| COAST DISTRICTS: | | | | | | | | | | | | | | | | | | | |
| Ventnor..... | 77 | 50 | 27 | 68.5 | 57.4 | 11.1 | 61 | | | | | | | | | | | 6 | 1.7 |
| Worthing..... | 79.5 | 48.5 | 31 | 70 | 56 | 14 | 61 | | | | | | | | | | | 5 | 1 |
| Ryde..... | 87 | 48 | 39 | 74.5 | 52.8 | 21.7 | 62 | | | | | | | | | | | | |
| COL. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |

METEOROLOGICAL TABLE,

Showing the monthly mean highest temperature by day; the monthly mean lowest temperature by night; the monthly mean daily range; and the mean temperature of the month; at the undermentioned places during a period of five years from 1853 to 1857 inclusive, for the three summer months.

| TABLE No. 12. | JUNE. | | | | JULY. | | | | AUGUST. | | | |
|------------------|---------------------------|---------|--------|-----------------------------------|---------------------------|---------|--------|-----------------------------------|---------------------------|---------|--------|-----------------------------------|
| | Highest, in the shade. | Lowest. | Range. | Mean temperature of the month. | Highest, in the shade. | Lowest. | Range. | Mean temperature of the month. | Highest, in the shade. | Lowest. | Range. | Mean temperature of the month. |
| Brighton | 66.4 | 52 | 13.4 | 57.4 | 68.7 | 55.1 | 13.6 | 60 | 70 | 55.8 | 14.2 | 61.2 |
| Greenwich | 70.2 | 48.9 | 21.3 | 57.7 | 73.6 | 53.1 | 20.5 | 61.4 | 74.2 | 53.8 | 20.4 | 62.3 |
| Nottingham | 68.8 | 48 | 20.8 | 56.6 | 70.8 | 51.1 | 19.9 | 59 | 71.5 | 51.2 | 20.3 | 60 |
| Uckfield | 70.4 | 48 | 22.4 | 57.5 | 73.8 | 51.6 | 22.2 | 60.8 | 75 | 52 | 23 | 61.8 |
| Ventnor | 63.6 | 53.1 | 10.5 | 56.4 | 67.1 | 57.6 | 9.5 | 60.5 | 70.4 | 58.5 | 11.9 | 62.7 |
| Worthing | 64.4 | 53.4 | 11 | 56 | 67 | 56 | 11 | 59.8 | 68.6 | 56.7 | 11.9 | 61 |
| Ryde | 71.8 | 50.4 | 21.4 | 59.2 | 74.9 | 54 | 20.9 | 62.6 | 75.1 | 55.3 | 19.8 | 63.5 |

SUMMER.

JUNE, JULY, AUGUST.

- 10.—*The Summer Climate of Brighton. Effect of the Sea upon adjoining Coasts during hot weather. Greater coolness of the Day Temperature as contrasted with that of Inland Situations. The Day-Temperatures of Brighton and Hassock's Gate compared. Erroneous impressions of the Summer Climate of Brighton. The direction of the Winds and average fall of Rain. The Summer formerly the season at Brighton. Sanative advantages of the Summer Climate of Brighton.*

With the spring months, March, April, and May, terminates the most objectionable, or, at all events, the least inviting period of the year at the sea-side. The greater coolness of the day-temperature, indeed, continues throughout the summer, and from the same cause, viz., the diminished temperature of the sea; but that which during the former period was objectionable, becomes, as the hot weather of summer approaches, a positive advantage. The sea acquires heat slowly, and never reaches throughout the summer, within several degrees of the mean maximum temperature of the air. The mean temperature of the sea

was 61.98 in June, 64.93 in July, and 67° in August. The highest point reached was 68° on the 13th of August. After this, it slowly lost heat. The temperature of the atmosphere on the land was much higher than this, and in many inland situations during June, last year (1858), when the heat was greater than had been experienced for 87 years previously, the thermometer in several inland situations rose to 95° in the shade and at Bedford it reached 97° *. The sea being upwards of 30° cooler than the highest temperature of the land atmosphere, and the atmosphere on its surface being cooled down to about the same point as the sea, it must necessarily have a cooling effect upon the atmosphere of adjoining coasts, more particularly when the wind comes from the sea; we accordingly find all sea-side places, and more especially those which are exposed to the south-west winds, much cooler during the day than inland places, where the atmosphere gets heated by the more powerfully radiating surface of the land. It will be seen from the foregoing tables (Nos. 9, 10, 11, col. 4) that the mean maximum temperature for the three summer months, June, July, and August, for Brighton and Greenwich was—

| | JUNE. | | JULY. | | AUGUST. |
|-----------------|----------------|-----|----------------|-----|----------------|
| Brighton | $72^{\circ}.8$ | ... | $68^{\circ}.1$ | ... | $69^{\circ}.5$ |
| Greenwich | $79^{\circ}.5$ | ... | $73^{\circ}.8$ | ... | $75^{\circ}.6$ |

* The Registrar General's Quarterly Return, No. 38, p. 22.

Making a difference in favour of the coolness of the Brighton air of from five to seven degrees.

The results recorded at other inland situations do not vary materially from Greenwich, and even in Yorkshire, the summer temperature is often greater than that which is experienced by districts on the south and south-west coast. At Hyde Park the morning temperature, throughout the summer, exceeds that of Brighton at 9 o'clock (col. 8) by from three to four degrees; at 12 o'clock (col. 9) by from six to eight degrees.

As at other periods of the year, though the days are cooler during the summer at the sea-side, the nights are warmer by two or three degrees than in inland districts. This reduces the range of temperature, between the maximum and minimum, to considerably narrower limits. At Brighton and Greenwich last year the range was—

| | JUNE. | | JULY. | | AUGUST. |
|-----------------|-------|-----|-------|-----|---------|
| Brighton | 16°.3 | ... | 14°.8 | ... | 13°.1 |
| Greenwich | 25°.6 | ... | 22° | ... | 23°.5 |

being, on the average, nine degrees less on the coast. At Nottingham, which is further inland, the range of temperature is still greater than at Greenwich. The mean temperature, (col. 8) it will be observed, at the sea-side, does not differ very materially from that of inland places; for though the days are cooler, yet the nights are warmer, which brings the *mean* result to about the same point. This shows

how little the *mean* temperature of a place is to be depended upon as affording any indication of the climate of a place: that two places having the same mean temperature may differ most materially in climate. Take, for instance, Brighton and Nottingham for the month of July, when the *mean* temperature was the same within a fraction at both places, being respectively $58^{\circ}.8$ and $58^{\circ}.5$. Yet the mean maximum day-temperature was five degrees warmer, and the mean minimum night-temperature five degrees colder at Nottingham, and the range of temperature therefore was nearly double that of Brighton.

The fall of rain at Brighton for the three months was about one inch less than at Greenwich.

The idea that Brighton is a hot place in the summer as contrasted with inland situations, is utterly erroneous. The well-known cooling effect of the sea air upon coasts during the summer, the numerous direct observations made for a series of years upon the temperature at Brighton and other sea-side situations, together with the effect of the air upon the feelings, all prove the contrary. The great freshness and coolness of the air on reaching the south side of the downs and on arriving at Brighton, is a matter of common remark to those who are in the habit of frequently coming into Brighton from inland situations during hot weather; and I have this summer (1859) had an opportunity of comparing daily for a period of eight

weeks the temperature of Brighton with that of Hassock's Gate about seven miles inland, and about three quarters of a mile on the north side of the downs; the results of which I now give *in extenso*. It will be observed that during May and the early part of June, Brighton was generally the warmest; but as the hot weather set in, it averaged about four degrees cooler than Hassock's Gate; and once only during the hot weather on the 3rd of July, when a land wind prevailed, was the thermometer at Brighton as high as at Hassock's Gate. The nights throughout were several degrees warmer at Brighton:—

THERMOMETER.

| | | Highest in the shade. | | | | Highest in the shade. | |
|------|----|-----------------------|-----------------|------|----|-----------------------|-----------------|
| | | Brighton. | Hassock's Gate. | | | Brighton. | Hassock's Gate. |
| May | 17 | 54 | 52 | June | 14 | 69 | 72 |
| " | 18 | 53 | 54 | " | 15 | 68½ | 70 |
| " | 19 | 62 | 61 | " | 16 | 68½ | — |
| " | 20 | 62 | 61 | " | 17 | 71 | 71 |
| " | 21 | 63 | 59 | " | 18 | 73 | 76 |
| " | 22 | — | 57 | " | 19 | — | 72 |
| " | 23 | 66 | 63 | " | 20 | 67 | 72 |
| " | 24 | 70½ | 69 | " | 21 | 70 | 67 |
| " | 25 | 66 | 75 | " | 22 | 68 | — |
| " | 26 | 68½ | 69 | " | 23 | 68 | 77 |
| " | 27 | 70 | 68 | " | 24 | 69 | 74 |
| " | 28 | — | 66 | " | 25 | 76 | 78 |
| " | 29 | 72 | 77 | " | 26 | — | 78 |
| " | 30 | 72 | 79 | " | 27 | 75 | 79 |
| " | 31 | 78 | 78 | " | 28 | 71 | 71½ |
| June | 1 | 72 | 74 | " | 29 | 70 | 71 |
| " | 2 | 74 | 73 | " | 30 | 74 | 71 |
| " | 3 | 71 | 74 | July | 1 | 73 | 77 |
| " | 4 | 72 | 79 | " | 2 | — | 76 |
| " | 5 | — | 78 | " | 3 | 83½ | 83½ |
| " | 6 | 75½ | 82 | " | 4 | 73 | 81 |
| " | 7 | 74½ | 78 | " | 5 | 72 | 77 |
| " | 8 | 78 | 79 | " | 6 | 74 | 80½ |
| " | 9 | 77 | 74 | " | 7 | 76 | 84 |
| " | 10 | 63 | 67½ | " | 8 | 78 | 82 |
| " | 11 | 67½ | 72 | " | 9 | 78 | 86 |
| " | 12 | 65 | 70 | " | 10 | — | 85 |
| " | 13 | 72 | 78 | " | 11 | 81½ | 85 |

The extent of the difference in temperature between coast and inland situations, as well as many of the other more important

qualities of the atmosphere, depend upon the direction of the winds. I have never known, in the course of many years' experience, the air of Brighton otherwise than cool and refreshing, when the wind blows from the south-west or west. Neither can it be different when it reaches the coast, cooled by the constant and rapid evaporation from the surface of thousands of miles of the Atlantic Ocean, which it has passed over in its course hitherward. When the wind comes from the land side the case is very different. It is then much drier and warmer, and the climate of the place is assimilated very much to that of inland districts. The south and south-east winds are also generally very warm and depressing, as they come from the adjoining continent, and the extent of sea surface they have to traverse before reaching our coast is not sufficient to have any very decided refrigerating effect upon them. It is with these latter winds that we get our sea mists during the spring and early summer; the moisture of the warmer air being condensed and rendered visible by the cooler stratum of air it meets with on reaching this country.

Last summer (1858) the heat was much above the average, particularly in June; but the only uncomfortably hot days we experienced at Brighton, were the 15th and 16th of the month, when on the former day the temperature in the shade rose to 86°,

which is the highest point I have ever known the thermometer at Brighton; but at other places, and in many parts of London it was ten degrees warmer.

The following was the state of the thermometer at Hyde Park and Brighton at 12 o'clock on the 15th and 16th of June:—

| | 15th. | 16th. |
|--------------------------------|-------|-------|
| Royal Society Receiving House, | | |
| Hyde Park | 89° | 93° |
| Brighton (West Cliff)..... | 81° | 77° |

The 16th was the hottest day in London, the 15th at Brighton. But during these very hot days the internal temperature of my own house, in those parts of it which were sheltered from the sun, did not exceed 78°; and it never afterwards throughout the year exceeded 75°; but of course some management is required to keep a house cool in hot sunny weather; and the atmosphere of a room with several windows exposed for many hours to the sun, without *outside* blinds, will get up to a tropical temperature.

The annexed table gives the daily, highest, readings of the thermometer at Brighton and Greenwich, during the recent hot weather of the present year, 1859:—

| Highest in the shade. | | Highest in the shade. | |
|-----------------------|------------------|-----------------------|------|
| Brighton. | | Brighton. Greenwich. | |
| July | 6.....74 .. | 18.....81.5..... | 93 |
| " | 7.....76 | 19.....75 | 84 |
| " | 8.....78 | 20.....76 | 83 |
| " | 9.....78 | 21.....73 | 79 |
| " | 10.....— | 22.....72 | 81 |
| " | 11.....81.5..... | 23.....71 | 69.3 |
| " | 12.....78 | 24.....70 | 72 |
| " | 13.....78 | 25.....70 | 77 |
| " | 14.....75 | 26.....72 | 82.8 |
| " | 15.....73 | 27.....72.5..... | 85 |
| " | 16.....75 | 28.....75.5..... | 83 |
| " | 17.....75 | 29.....74.5..... | 77.9 |

On the very hot days, the 12th, 13th, and 18th of the month, it will be observed that Greenwich was from 11 to 14 degrees warmer than Brighton. On one day only, on the 23rd, when the temperature at Greenwich went down to 69° was Brighton the warmest, showing the greater equableness of coast climates.

The only way that I can account for Brighton having got the name of being hot during the summer, is from the heat and glare along the front walks and drives, where the sun's rays are reflected and radiated from the houses, pavements, and sea, thereby rendering the heat and glare of those parts very great during clear, sunny weather: so much so, indeed, that it is hardly safe for delicate persons, or those liable to head affections, to expose themselves to it. But notwithstanding the great heat and glare of these situations they are the most common resort of the visitors (many of whom are here for only a few days, or perhaps hours), even during the hottest periods of the day, when of course they feel the heat and glare excessively, and form their opinions of the place accordingly. But the great heat of these particular situations is quite exceptional, caused entirely by artificial circumstances, and would be equally as great in any other place under similar conditions. They afford, in fact, no criterion whatever of the general temperature of the atmosphere of the place, any more than that of an artificially-heated room does of the temperature of the rest of the house.

To show what little correct information the public possess on these matters, I may mention, that the watering place, Ryde, which is in the greatest repute, or nearly so, as a summer resort, and is even recommended at that period of the year by an eminent physician, Sir James Clarke, is hotter in the summer than any other watering place of which we possess any recorded data. The mean maximum temperature last July, 1858 (see tables, Nos. 9, 10, 11), at Ryde was eight degrees higher than at Brighton, and three higher than at Greenwich, an inland situation. In August it was five degrees higher than at Brighton, and but one degree cooler than Greenwich. The table (No. 12) giving the average of five years, shows about the same results. The great heat of Ryde, as contrasted with Ventnor, is also alluded to by Dr. Martin, and when we consider the situation of Ryde, being on the north side of the island, over which the cooling west winds have to pass before they reach it, the greater heat of its summer climate will be readily understood. In fact the climate of Ryde throughout the year differs but little in its general properties from that of inland situations. I do not mention this circumstance in deprecation of the place, for I readily admit that it has many advantages during the summer which Brighton does not possess, but only to prove that heat is not the only circumstance considered in the choice of summer situations; for if it were

people would never crowd either to Ryde, or the continental watering places, in which latter the heat immensely exceeds that of any part of England.

The objections to Brighton during the summer have always appeared to me to be, not the heat, (always excepting the walk near the houses facing the sea) but the glare and want of country. The former, owing to the reflection of the sun's rays from the sea, and the absence of trees and plantations, is no doubt very trying during bright sunny weather. What is wanted is shelter of some kind along the front; and in the absence of trees, which probably would never thrive in this dry chalky soil, so close to the sea, a canvass awning over some portion of the Esplanade, so arranged that it could be drawn up during stormy weather, and removed as soon as the hot weather was over, and under which people could sit and enjoy the sea-breezes, sheltered from the effect of the sun, would be, it has always appeared to me, the best, and probably not an ineffectual substitute. Under present circumstances, the parts along the front of the sea, though very pleasant during the morning and evenings, are better avoided during the heat of the day; and those who at that time are compelled to be out, should take the shady back streets of the town, and where, by passing through the Western Road, North Street, and St. James's Street, shade may be obtained from one end of Brighton to the other.

The want of country within an easy walk of the town is also unquestionably a great objection to the place during the summer; but, at the same time, this can hardly be said to apply to those who can enjoy the luxury of horse or carriage exercise. The down-air is the finest in the world, the scenery is beautiful, and on their summit, even during the hottest and stillest weather, there is always a breeze blowing.

The prevailing wind during the summer, as will be seen from the following table, comes from the south-west, which, taking the average of the last six years, blows 17 days during the month of June; 20.5 during July; and 20.3 during August; forming a larger proportion than that of all the other winds put together:—

| | South-West. | North and North-East. | South-East and East. | Other directions. | Days. |
|----------|-------------|-----------------------|----------------------|-------------------|-------|
| June ... | 17 | 7.5 | 4.5 | 1 | 30 |
| July ... | 20.5 | 4.5 | 3 | 3 | 31 |
| August.. | 16.3 | 7.4 | 3.5 | 38 | 31 |

The fall of rain at Brighton during the summer months, on the average of five years, was as follows:—

| | JUNE. IN. | JULY. IN. | AUGUST. IN. |
|------------------|--------------|--------------|----------------|
| Brighton..... | 2.0 | 1.5 | 2.2 |
| Uckfield | 3.1 | 2.5 | 3 0 |
| Chichester | 2.5 | 2.3 | 2.3 |
| Glynde | 2.8 | 1.9 | 2.5 |
| Buxted Park ... | 3.2 | 2.3 | 3.2 |
| Hastings..... | 1.9 | 1.8 | 2.5 |
| Greenwich | 2.4 | 3.0 | 2.5 |

The summer season at Brighton at the present time chiefly, probably, on account of its supposed heat, does not enjoy that reputation, or attract that number of visitors which the real properties and advantages of its climate entitle it. But there can be no question that the reputation of the various places of resort for invalids, as well as for those who simply require change of air, is regulated as much, if not more, by mere fashions or habits: by the almost instinctive desire of falling in with the prevailing notions of the day: than by any real advantages of climate they possess. Hence what are called the seasons at watering places are constantly changing. In Dr. Russel and Dr. Relhan's time—1753, 1761,—the summer was the season at Brighton, when “lodgings only were sought after.”* Dr. Relhan observes (p. 4), “The merit of the situation of this town has, within these few years, attracted a great resort of the principal gentry of this kingdom, and engaged them in a *summer* residence here. And there is reason to believe that in the earliest times it was in the highest estimation.” And, at p. 22, he says, “Although the inland parts of this kingdom may more nearly resemble the continent in the degrees and duration of heat and cold, yet such as are situated near the sea, and constantly refreshed in summer by a temperate

* A short history of Brighton, with remarks on its air, and an analysis of its waters by Anthony Relhan. Published 1761; re-edited 1829, by James Charles Mitchell. Introduction, p. 13.

breeze, and have in winter a speedy period put to their frost and snow by a warm sea wind."

"This is remarkably verified at Brighthelmston; in the summer a sea-breeze prevails, which rises and dies away with the sun, with this observable in it, that the warmer the day is, the more cooling and fresh is the breeze; so that the utmost suffocating heats which sometimes happen in the summer in this island, and which are intolerable even to the natives of Jamaica, are never felt here."

If people generally would investigate these things for themselves, instead of trusting so much to mere "public report," which, though generally originating in some fact (as in this instance, probably from the great heat of some of the front walks) becomes afterwards, by degrees, more and more distorted, and eventually entirely incorrect, there would be every prospect of our ultimately arriving at the truth; and each place would then receive that amount of attention and patronage which, either from its salubrity or other advantages, it deserves.

In recommending Brighton, however, as a place of summer resort, from the beginning of June, I wish to guard myself from being misunderstood, especially as I am expressing an opinion not in unison with the one now generally received. The question as to whether such or such a place is suitable, or not, must depend upon the object each person has in view. When this is not a matter of health, but one simply of

amusement, or of change of scene and occupation, any place not positively unhealthy may be chosen, which either fashion, or fancy, may dictate. For this description of persons, especially those fond of the country, "of shady walks and groves," I can readily understand Brighton not being a favourite place; neither should I ever think, under such circumstances, of recommending it.

But the case is very different when the change is required either for the restoration of declining health, or for the cure of disease. The coolness and freshness of the sea-breezes, which during the summer come chiefly from the south-west, render that period of the year at Brighton equal, if not superior, to any other, in all those complaints in which a marine air is found to be beneficial. Children and young persons generally enjoy the summer at the sea-side, and they derive the more advantage from it, as the fineness of the weather enables them to pass so much of their time on the beach, which to young children affords a never-failing source of amusement. Some caution, however, is required in not allowing children who have been accustomed to an in-door life, to be too much out in the air on their first arrival. The impression produced on the system by so sudden a change in the habits of life, is sometimes very great, and liable to produce disorder of the bowels and digestive organs, which not unfrequently proves very troublesome and obviates the good which otherwise would have

been derived from the climate. Neither at any time, nor under any circumstances, should delicate ailing children be allowed to frequent the sunny and exposed parts of the town during the middle of the day. During very hot weather children ought not to be on the beach after half-past 10 o'clock in the morning, or before 4 o'clock in the afternoon. It must not be supposed that all the time spent in doors is lost. On the contrary, the in-door atmosphere, particularly during the summer, when the windows can be kept open, differs in no essential points from the external air, and many derive great benefit from a change to the sea-side, though confined entirely to the house.

I have often been surprised that the summer season at Brighton, which in a sanative point of view, in most complaints, is equal to any period of the year, and when the best accommodation is to be had, at very reduced prices, is not more taken advantage of by the enormous populations of London and other large towns, to whom and to the younger members especially, a few weeks' change from the close atmosphere of towns to the fresh breezes from the sea, would be attended both at the time and in after-life, with the best effects, and be the means of restoring many to health, who now sink, or linger on in a debilitated state of health, under the depressing effects of a vitiated atmosphere.

METEOROLOGICAL TABLE FOR SEPTEMBER, 1858.

| TABLE, No. 13. | | Highest. | Lowest. | Range. | Mean | | | | | | Maximum Rays of the Sun. | Sea. | | Winds, direction. | | | | No. of days. | Rain. | | |
|--------------------------------------|--|----------|---------|--------|------|------|------|--------------|-------------------------|-------------------|--------------------------|-------------------|-----|-------------------|---------|-------------|-----------------------|-----------------|-------------|-----|---------|
| Col. | | 1. | 2. | 3. | 4. | 5. | 6. | Daily range. | Temperature of the air. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | | Highest. | Lowest. | South West. | North and North East. | South and East. | North West. | | Amount. |
| BRIGHTON : | | | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebbell..... | | 75.5 | 44.5 | 31 | 67.5 | 57 | 10.5 | 61 | 61.7 | 65.5 | 66.1 | 98 | | ° | ° | 17 | 8 | 4 | 1 | 10 | 1.3 |
| Kemp Town,—J. O. N. Rutter, Esq.... | | 75 | 43 | 32 | 66.6 | 54 | 12.6 | 59 | 62.4 | | 64.6 | | | ° | ° | 65 | 61.5 | | | | |
| North Central,—“Brighton Herald.”... | | 75 | 44 | 36 | 67 | 56 | 11 | 60.2 | | | | | | | | | | | | | |
| INLAND DISTRICTS : | | | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | | 83.8 | 41.5 | 42.3 | 70.9 | 52.6 | 18.3 | 60.5 | | 61.3 | 67.6 | | | | | | | | | 10 | 0.9 |
| Hyde Park,—Mr H. Williams. | | | 42 | | 51.3 | | | | | | | | 98 | | | | | | | 13 | 1.1 |
| Uckfield,—C. L. Prince, Esq. | | 79.8 | 40 | 39.8 | 68.7 | 52.1 | 16.6 | 59.1 | | | | | | | | | | | | 16 | 2.3 |
| Nottingham | | 85 | 37.9 | 47.1 | 68.2 | 49.1 | 19.1 | 57.3 | | | | | | | | | | | | | |
| York | | 72 | 46.2 | 25.8 | 63.6 | 52.9 | 10.7 | 57.1 | | | | | | | | | | | | 16 | 2.1 |
| COAST DISTRICTS. | | | | | | | | | | | | | | | | | | | | | |
| Ventnor | | 75 | 50 | 25 | 63.4 | 58.3 | 5.1 | 59.5 | | | | | | | | | | | | 9 | 1.4 |
| Worthing | | 75.6 | 48 | 27 | 67.7 | 56.7 | 11 | 61 | | | | | | | | | | | | 15 | 3 |
| Ryde | | 80 | 45 | 35 | 71.1 | 51.3 | 19.8 | 60 | | | | | | | | | | | | | |
| Col. | | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | |

METEOROLOGICAL TABLE FOR OCTOBER, 1858.

| TABLE, No. 14. | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------|---------|--------|-------------------------|----------------|--------------|-------------------|---------------|-------------------|--------------------------|----------|---------|-------------------|-----------------|-----------------|-------------|--------------|---------|-----|--|
| Col. | Mean | | | | | | | | | | Sea. | | Winds, direction. | | | | Rain. | | | |
| | Highest. | Lowest. | Range. | Temperature of the air. | | | | | | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and East. | South and East. | North West. | No. of days. | Amount. | | |
| | | | | Of all Highest. | Of all Lowest. | Daily range. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | | | | | | | | | | | |
| BRIGHTON : | | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebbell..... | 65 | 35 | 30 | 58.9 | 48.5 | 10.4 | 52.6 | 52.5 | 56.4 | 57.1 | 79 | 62 | 54 | 12 | 15 | 3 | 1 | 8 | 1.2 | |
| Kemp Town,—J. O. N. Rutter, Esq. . . | 64 | 35 | 29 | 57.1 | 45.2 | 11.9 | 50.1 | 52.6 | 54.3 | 50.0 | 75 | | | | | | | | | |
| North Central,—“Brighton Herald.” . . | 63 | 37 | 26 | 57.6 | 48 | 9.6 | 51.7 | | | | | | | | | | | | | |
| INLAND DISTRICTS : | | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory. | 69.5 | 33 | 36.5 | 53.9 | 43.9 | 16 | 50.0 | 50.5 | 57.1 | | | | | | | | | 9 | 1.2 | |
| Hyde Park,—Mr H. Williams..... | 26 | | | 44.4 | | | | | | | 82 | | | | | | | 11 | 1.8 | |
| Uckfield,—C. L. Prince, Esq..... | 66.4 | 29.6 | 36.8 | 61 | 44.6 | 16.4 | 51.8 | | | | | | | | | | | 14 | 3.4 | |
| Nottingham | 69.5 | 32.2 | 37.3 | 57.5 | 42.1 | 15.4 | 49 | | | | | | | | | | | 16 | 2.4 | |
| York | 65 | 32 | 33 | 52 | 41.4 | 10.6 | 45.7 | | | | | | | | | | | | | |
| Clifton | 65.3 | 31.3 | 34 | 56.0 | 45 | 11.9 | 50 | | | | | | | | | | | 14 | 2.3 | |
| COAST DISTRICTS : | | | | | | | | | | | | | | | | | | | | |
| Ventnor | 66 | 37 | 29 | 58.8 | 49.6 | 9.2 | 53.2 | | | | | | | | | | | 11 | 1.6 | |
| Worthing | 65.4 | 36.8 | 23.6 | 60 | 47.7 | 12.3 | 52.8 | | | | | | | | | | | 9 | 1.9 | |
| Osborne | 68.2 | 36.5 | 31.7 | 59.9 | 47 | 12.0 | 52.4 | | | | | | | | | | | | | |
| Col. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | |

METEOROLOGICAL TABLE FOR NOVEMBER, 1858.

117

| TABLE, No. 15. | Col. | Highest. | Lowest. | Range. | Mean | | | | | | Sea. | | Winds, direction. | | | | Rain. | | | |
|---------------------------------------|------|----------|---------|--------|-----------------|----------------|--------------|---------------------|-------------------|---------------|-------------------|--------------------------|-------------------|---------|-------------|-----------------------|-----------------|-------------|--------------|---------|
| | | | | | Of all Highest. | Of all Lowest. | Daily range. | Temperature of air. | At 9 o'clock a.m. | At 12 o'clock | At 3 o'clock p.m. | Maximum Rays of the Sun. | Highest. | Lowest. | South West. | North and North East. | South and East. | North West. | No. of days. | Amount. |
| | | | | | | | | | | | | | | | | | | | | |
| BRIGHTON: | | | | | | | | | | | | | | | | | | | | |
| West Cliff,—Dr. Kebbell..... | | 53 | 26 | 27 | 45.7 | 36.7 | 9 | 40.8 | 40.6 | 43.9 | 43.9 | 62 | 51.5 | 40 | 5 | 22 | 3 | | 8 | 1.3 |
| Kemp Town,—J. O. N. Rutter, Esq.... | | 53 | 25 | 28 | 43.8 | 36 | 7.8 | 30.5 | 40.2 | 43.1 | 39.6 | | | | | | | | | |
| North Central, "Brighton Herald"..... | | 51 | 25 | 26 | 44.6 | 37.5 | 7.1 | 40.6 | | | | | | | | | | | | |
| INLAND DISTRICTS: | | | | | | | | | | | | | | | | | | | | |
| Greenwich,—Royal Observatory..... | | 58 | 20.5 | 37.5 | 46.1 | 33.6 | 12.5 | 39.4 | | 43.1 | | | | | | | | | 7 | 0.4 |
| Hyde Park,—Mr H. Williams..... | | 20 | 20 | | 35.2 | | | | 39 | | | 67 | | | | | | | 6 | 1.4 |
| Uckfield,—C. L. Prince, Esq..... | | 53.2 | 20.6 | 32.6 | 45.7 | 33.7 | 12 | 39.3 | | | | | | | | | | | 8 | 0.7 |
| Nottingham..... | | 51.8 | 26 | 25.8 | 46.9 | 36.9 | 10 | 41.5 | | | | | | | | | | | 13 | 1.5 |
| Clifton..... | | 54.9 | 22.8 | 32.1 | 45.1 | 34.6 | 10.5 | 39.4 | | | | | | | | | | | 15 | 1.3 |
| York..... | | 51 | 17 | 34 | 44.4 | 33.4 | 11 | 37.9 | | | | | | | | | | | 13 | 2.1 |
| COAST DISTRICTS: | | | | | | | | | | | | | | | | | | | | |
| Ventnor..... | | 55 | 31 | 24 | 48.4 | 40.4 | 8 | 44 | | | | | | | | | | | 10 | 1.6 |
| Worthing..... | | 51.8 | 26 | 25.8 | 46.9 | 36.9 | 10 | 41.5 | | | | | | | | | | | 10 | 1.8 |
| Osborne..... | | 56.9 | 25.4 | 31.5 | 47.1 | 37.2 | 9.9 | 41.7 | | | | | | | | | | | | |
| Col. | | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. |

METEOROLOGICAL TABLE,

Showing the monthly mean highest temperature by day; the monthly mean lowest temperature by night; the monthly mean daily range; and the mean temperature of the month; at the undermentioned places, during a period of five years, from 1853 to 1857 inclusive, for the three autumn months.

| TABLE No. 16. | SEPTEMBER. | | | | OCTOBER. | | | | NOVEMBER. | | | |
|------------------|---------------------------|---------|--------|-----------------------------------|---------------------------|---------|--------|-----------------------------------|---------------------------|---------|--------|-----------------------------------|
| | Highest, in the shade. | Lowest. | Range. | Mean temperature of the month. | Highest, in the shade. | Lowest. | Range. | Mean temperature of the month. | Highest, in the shade. | Lowest. | Range. | Mean temperature of the month. |
| Brighton | 67.1 | 55.2 | 11.9 | 59.8 | 59.4 | 48.8 | 10.6 | 53.1 | 48.6 | 40.2 | 8.4 | 44 |
| Greenwich | 68.3 | 48.2 | 20.1 | 57 | 59.7 | 44.9 | 14.8 | 51.6 | 48.2 | 36.8 | 11.4 | 42.5 |
| Nottingham | 66.2 | 47 | 19.2 | 55.2 | 57.5 | 42.4 | 15.1 | 48.9 | 46.8 | 34.7 | 12.1 | 40 |
| Uckfield | 69 | 47.2 | 21.8 | 56.8 | 61.2 | 44.5 | 16.6 | 51.8 | 49 | 36 | 13 | 42.1 |
| Vennor | 66.5 | 56.3 | 10.2 | 60.1 | 59.2 | 51 | 8.2 | 54.1 | 50.5 | 42.6 | 7.8 | 45.6 |
| Worthing | 64.5 | 52.1 | 12.4 | 57 | 57.6 | 48.8 | 8.8 | 52.2 | 48.2 | 39.8 | 8.4 | 43.5 |
| Ryde | 69.4 | 50.8 | 18.6 | 59.8 | 61.4 | 46.3 | 15.1 | 53 | 50.5 | 37.8 | 12.3 | 43.6 |

AUTUMN.

SEPTEMBER, OCTOBER, NOVEMBER.

11.—*The greater relative warmth of the days on the Sea-Coast on the approach of cold weather. The unusual severity of the cold during the Autumn of 1858. The mean temperature. The Temperature at Brighton and Hyde Park at 9 a.m. compared. The mean direction of the winds. The average fall of rain. The Autumn the season at Brighton. Its superiority over the Winter much over-estimated. The danger incurred by delicate persons in sitting out too late in the evening during the latter part of Autumn.*

After August, the maximum day-temperature on the coast gradually gains upon that of the inland districts. In August last year (see table No. 11), the mean maximum temperature at Greenwich was six degrees in excess of the mean maximum temperature at Brighton. In September this difference was reduced to nearly three degrees; in October, to one degree; while in November there was but a fractional

difference between these two places. Taking the average of five years (see table No. 16), Greenwich is only one degree warmer in September, $\frac{3}{10}$ of a degree in October, while in November, Brighton becomes half a degree the warmest. Last autumn there is no doubt that the relative temperature of the sea-coast and inland places was, in some degree, affected by the unusual prevalence of the north-east winds, and the absence of the equinoctial gales, which retarded the arrival of the gulf-stream, thereby rendering the sea on our south and south-west coasts colder than it generally is at this season of the year. During November last year (1858) the sea was colder than it generally is in January. On November 23rd, it had cooled down to 40° . In December, after a change in the wind, and a considerable fall of rain, it rose to 47° , and averaged throughout January about 44° . The atmosphere, therefore, was deprived of the usual amount of heat it obtains from the sea at this time of the year. The north-east winds prevailed from the 18th of October to the 24th of November. The cold was unusually severe from the 15th to the 24th of November, when the ice was thick enough to admit of skating on the ponds and ornamental waters of London. "On the 24th the temperature at many stations was below 20° , and at Royston, in Hertfordshire, the temperature decreased to the point 11° .

The mean temperature of the 23rd and 24th at Greenwich was lower than that of any two consecutive days in November during the last 45 years."* The lowest point reached at Brighton was 26° on the night of the 22nd.

The average mean night-minimum temperature last autumn, at Brighton, was about four degrees in excess of that at Greenwich, and the range of temperature between the day-maximum and night-minimum was eight degrees less at Brighton than at Greenwich in September; six degrees less in October, and three in November.

The mean temperature of the air during November last year at Brighton was four degrees below the average of the previous five years. At Greenwich it was three degrees below the average of the same period.

It is important also to observe, that the temperature at 9 o'clock in the morning at Brighton, like the maximum day temperature, also gradually gains upon that of inland districts on the approach of colder weather. In August it was three degrees warmer at 9 o'clock a.m. in Hyde Park than at Brighton; but in September, Brighton at this hour became slightly the warmest, and in October and November the temperature at Brighton at 9 o'clock gained upon that of Hyde Park to the extent of two degrees.

* Remarks by James Glaisher, Esq. Mortality Return for December, 1858.

The annexed table shows the mean direction of the winds on the average of five years, from 1853 to 1857 :—

| | S.W. | N.E. | South-East. | Other directions. | Days. |
|---------------|---------|---------|-------------|-------------------|-------|
| September... | 13.6... | 11.2... | 3.2... | 2 | 30 |
| October | 13 | 13.6... | 3 | 1.4 | 31 |
| November ... | 5 | 19.4... | 3 | 2.6 | 30 |

Last November the south-west winds blew on two days only and the north-east twenty-three days out of the thirty; but the north-east winds would seem to have been unusually prevalent during November for some years past, thereby rendering this month proportionably cold. Taking the average of the last six years, both at Brighton and Greenwich, the mean temperature of November has been nine degrees below that of October; while during the previous ten years the difference between the mean temperatures of the two months was only five degrees.

The following table gives the average fall of rain during the autumn months at Brighton and Greenwich, and some other places in Sussex during a period of five years, according to the returns formerly mentioned :—

| | SEPTEMBER. IN. | | OCTOBER. IN. | | NOVEMBER. IN. |
|------------------|-------------------|-------|-----------------|-------|------------------|
| Brighton..... | 3.3 | ..... | 4.6 | ..... | 2.3 |
| Chichester | 4.1 | ..... | 5.6 | ..... | 2.3 |
| Glynde | 4.3 | ..... | 5.2 | ..... | 3.1 |
| Uckfield | 4.2 | ..... | 5.6 | ..... | 2.6 |
| Buxted Park ... | 4.3 | ..... | 5.6 | ..... | 2.6 |
| Hastings..... | 3.7 | ..... | 4.4 | ..... | 2.6 |
| Greenwich | 2.7 | ..... | 3.8 | ..... | 2.3 |

In popular estimation the autumn quarter is the most pleasant period of the year at Brighton, and during October and November the demand for houses and apartments is greater than even the present increased dimensions of the place are capable of supplying. Taking all things into account, the equableness of temperature, the dryness and softness of the air, the absence of fogs, the greater amount of sunshine, it must be admitted that the public have decided correctly on this point, and that the Brighton climate appears to the greatest advantage during the two latter months; and that not only as compared with inland places, which at this period of the year, after the fall of the leaf, are proverbially damp and unpleasant; but also as contrasted with the other seasons of the year at the same place. But though some superiority of climate may be conceded for the autumn months at Brighton, yet there can be no question that, as respects the winter period, and particularly December and January, this superiority of climate during the autumn has been much over-estimated by those who frequent the place only during the latter period of the year. I do not know, indeed, of any advantage of climate possessed by Brighton during the autumn, that does not in an almost equal degree extend to the winter months. And so much is this the case, that in reading over the remarks on the winter season, they apply so generally to the

autumn months, that it leaves me but little to add on the latter subject.

The greater mildness of this season of the year of course changes materially the relative advantages of the various parts of the town, and up to the end of October, or beginning of November, the higher and more exposed parts of the town need not be avoided on account of cold draughts or winds. On the contrary, in some complaints and forms of constitution, they enjoy a decided superiority over the more sheltered parts and those nearer the sea, which to some during the earlier autumn months give the idea of being somewhat enervating and relaxing, at all events as compared with the higher and more bracing districts.

It cannot fail to be observed the late hour in the day to which, during the autumn months, many of the visitors remain out walking or even sitting on the seats on the esplanades. The greater dryness and warmth of the evenings at the sea-side, during this part of the year, certainly admit of exposure to the air up to a later hour than would be safe in inland situations; but to those who have been accustomed to an indoor life, or to avoid the evening air, the practice, on the approach of cold weather, is not free from danger; and to it may be ascribed no inconsiderable proportion of the colds and coughs which are taken on first coming to the place

CHAPTER III.

12.—*The general efficacy of Climate and change of Air in the Cure of Diseases. The subject at present but little understood. Climate to be regarded rather as the means of placing Patients in the most favourable position for the action of other remedies.*

In this, the concluding part of the work, it will be my endeavour to bring under review, as briefly as the nature of the subject will admit, the climate of Brighton, as a remedial agent in disease. The broad principle of the efficacy of climate and change of air, both as a prophylactic and therapeutic agent, has long been universally acknowledged; and daily increasing experience tends rather to increase than diminish the estimation in which it is held, both by the profession, and the public generally, when judiciously had recourse to. I enter, however, upon this part of the subject with much less satisfaction, for though the general efficacy of change of air and climate in the cure of diseases is well known, we are still much in the dark respecting the adaptation of particular climates to particular diseases.

The knowledge we at present possess on this subject, indeed, is, with few exceptions, little better than mere guess-work, founded upon very limited and inconclusive data: a fact amply confirmed by the mistakes which are constantly made, even by the best-informed, in sending invalids to climates, which are found upon experience to be quite unsuited to their complaints and constitutions; and it is only, perhaps, after repeated trials, that the proper climate is found. It is, in fact, only within the last few years, since the extension of railways has given increased facilities for travelling; and a considerable amount of valuable information has been collected on the physical properties of the climates of many places and districts in this country, through the labours of Mr J. Glaisher, Secretary to the British Meteorological Society, and appended to the quarterly returns of the Registrar General; that any really satisfactory progress has been made in the subject. To what degree of perfection it may be possible to bring this department of the science of medicine, it is impossible, at the present time, to predict; but, judging from the progress which has recently been made in it, and to which the profession also stand much indebted to Sir James Clarke, who, by means of his work *On Climate*, has diffused much valuable information amongst both the profession and public generally, there is much reason to hope that it will eventually attain to the same degree of

proficiency as the other branches of the healing art.

As respects the curative properties of the Brighton climate, however accurate and extensive may be the knowledge of individual members of the profession, who have for many years practised in the place, no treatise has yet appeared upon the subject; all the published reliable information we at present possess being limited to a few lines in Sir James Clarke's work *On Climate*. I have therefore but few authentic data to go upon, beyond what I have obtained in the course of my own experience and investigations into the subject. On many points therefore I must speak hesitatingly, which future years of observation and experience will, I trust, enable me to discuss with greater confidence.

In treating of the remedial properties of any particular climate, in our present imperfect knowledge of the subject, and, perhaps, it may be said of Brighton more especially (respecting the qualities of whose climate much difference of opinion amongst the profession on many important points exists), it has always appeared to me, that the question which in the first instance requires investigation, as possessing the greatest amount of importance, is not so much that of any particular property of the climate, which may be of service in some particular disease, variety of disease or complication; or which may suit certain kinds of idiosyncrasies of constitution; as that of the general salubrity of the

place. For it is certain that if the atmosphere be free from all sources of disease, the complaints, with their varieties and complications, and the forms of constitution which will not be benefited by it, will form the exception; and the duty of the author, in that case, would be to point out, not so much what class of invalids may be benefited by resorting to the place, as those exceptional cases which require a particular kind of climate.

It is a mistake very frequently committed by unprofessional persons of ascribing to climate in too great a degree, certain specific properties in the cure of diseases; instead of looking upon it, rather as the means of placing the patient in the most favourable position for deriving the greatest possible amount of benefit from the usual remedial measures, whether of medicine, or those general matters of regimen, which are always necessary to enable the system to throw off disease and recruit its strength. It is very true that the change from the atmosphere of an unhealthy to that of a healthy place, will often enable the patient to dispense with medicines altogether; as in the former case they were necessary in order to overcome the noxious influence of the climate; while in the latter, the noxious influence being got rid of, the natural strength of the system: the *vis naturæ medicatrix*: by virtue of which there is always a tendency, unless interfered with, to the

establishment of health, is sufficient to effect a cure. But under any circumstances, however healthy may be the climate, or however well suited it may be to the nature of the complaint and constitution of the patient, it does not admit of inattention to those precautions and ordinary rules of health, which the nature of the case requires, and which are necessary under all circumstances.

13.—*Distinction between the Natural and Artificial Climate of a place. Defective Sanitary Condition of Brighton. Mortality of Brighton from infectious diseases from 1854 to 1857. The rate of mortality at Brighton and several other Places compared. Estimate of the number of preventable Deaths at Brighton caused by sanitary neglect. The Improved Sanitary Condition of the Hove District of Brighton.*

In treating, however, of the salubrity of any place, particularly of that of a large town, it is always necessary to make a distinction between its *natural salubrity*, (those physical properties of the atmosphere derived from its geographical position, the geological character of the soil, the vegeta-

ble productions on its surface, both of the district itself and the surrounding country), and its *artificial climate*, (or that condition of its atmosphere which it receives from the, *so-called*, civilized habits of life); because the neglect of the necessary arrangements for the removal of the impurities, consequent upon the congregation of a large number of persons within a limited space, will convert the most healthy natural situation into one of great unhealthiness: an evil which, ever since people began to live in towns, has been the chief cause of those deadly pestilences which have from time to time decimated nearly whole populations. And which, though considerable improvement has taken place in the condition of our town districts, is still the cause of an immense amount of sickness and premature death. The Registrar General, in his Sixteenth Annual Report, p. xvi., estimates the number of preventable deaths in England, on the average of ten years from 1841 to 1850, at 84,604 annually. "We want," he says, 19th Report, p. xxv., "pure air and pure water about our dwellings, and the refuse which infects the air, and makes man poison man, to be restored directly to the soil."

Brighton, unfortunately, it must be acknowledged, like nearly all other large towns in the country, is sadly defective in the most ordinary sanitary requirements, and, like them, suffers from all the evils consequent upon an impure state of the atmosphere,

and a high rate of mortality.* This subject I fully entered into in a work published in the year 1850, in which I unhesitatingly exposed the sanitary defects of the place, and pointed out the remedies necessary for their removal; and, on comparing the opinions expressed in the former work of the salubrity of Brighton, with those I am giving in the present, it might at first sight be thought that I was "blowing hot and cold" on the same subject; but the truth is, that in the former work I was treating solely of the evils resulting in the neglect of sanitary precautions: the *artificial climate* of Brighton; while in the present I am commenting on the *natural climate* of the place. Of the state of the former there is much to deplore, and the amount of preventable disease and death caused by it, chiefly amongst the poorer classes, is very considerable; but of the latter, the natural climate of Brighton, it is impossible to speak too highly: nature, in fact, has done everything for Brighton; art, little or nothing. The annexed table, which has been kindly prepared for me by the Registrar General, shows the number of deaths in Brighton from five of the most important diseases of the zymotic class, for four years, from 1854 to 1857, and the prevalence of which complaints is very correctly looked

* "The cleansing and the sewerage of all watering places requires improvement, as their arrangements were made when sanitary science was at a low ebb."—Registrar General's Nineteenth Annual Report, p. xxiii.

upon, as affording a very good criterion of the sanitary condition of the district:—

| | BRIGHTON. | | | | ENGLAND AND WALES. | | |
|-------------------------|-----------|-------|-------|--------------------|--------------------|---------|---------|
| | 1854 | 1855 | 1856 | 1857 | 1854 | 1855 | 1856 |
| ZYMOTIC DISEASES. | | | | | | | |
| Typhus | 69 | 37 | 48 | 57 | 18,332 | 16,032 | 15,398 |
| Small Pox | .. | 1 | 1 | 1 | 2,808 | 2,525 | 2,277 |
| Measles | 25 | 38 | 36 | 2 | 9,277 | 7,354 | 7,124 |
| Whooping Cough | 80 | 67 | 28 | 58 | 9,770 | 10,185 | 9,225 |
| Scarlatina * | 37 | 29 | 20 | 32 | 18,528 | 17,314 | 14,160 |
| Consumption | 237 | 215 | 179 | 171 | 51,284 | 52,290 | 48,950 |
| Deaths from all causes | 1,605 | 1,586 | 1,370 | 1,466 | 437,905 | 425,703 | 390,506 |
| | | | | | | | |
| BRIGHTON. | | | | ENGLAND AND WALES. | | | |
| Population, } 1841 | 46,661 | | | | 15,914,148 | | |
| enumerated } 1851 | 65,569 | | | | 17,927,609 | | |

The total deaths from these five diseases only, for the four years respectively, amounts to 211, 172, 133, and 150. Hooping-cough and typhus are the most fatal, forming, indeed, nearly three-fourths of the whole, and of these complaints more especially an immensely disproportionate number occurs amongst quite the poorest class of inhabitants, who reside in the undrained, densely populated, parts of the town. Hooping-cough is very fatal amongst the children of the poor, owing to the neglect of proper care in guarding them from cold, the parents being frequently compelled to take them out in the coldest weather, to get attendance at the public institutions, at a time when the children ought to be carefully

* "Of these deaths 2 were returned as having occurred from diphtheria in 1856; and 3 in 1857 in Brighton; and from the same disease in England and Wales the numbers were 186 in 1855, and 229 in 1856, but they have not been separately distinguished for the year 1854."

"The causes of deaths in England for the year 1857 are now being abstracted, but will not be completed for some months."

confined within doors. On going over the Brighton mortality registers some time since with Mr. Cresy, I was much surprised at the very small proportion of deaths from the infectious class of diseases which occurred in the parts of the town inhabited by the rich; for though these diseases may not be unfrequent amongst them, they are of a milder type, which, together with the greater care and comforts they are able to command in times of sickness, reduces the proportion of deaths to the number of cases to very small dimensions, as contrasted with that which obtains amongst the poor.

It is satisfactory, however, to know that Brighton, as respects its rate of mortality from all causes, does not contrast unfavourably with other towns of about the same size and character. The following table, extracted from the last (nineteenth) Report of the Registrar General, shows the deaths annually to 1,000 persons, living on the average of ten years, from 1841 to 1850, in some of the chief places of resort:—

| | Deaths annually to 1,000 persons living during the ten years, 1841 to 1850. | | Deaths annually to 1,000 persons living during the ten years, 1841 to 1850. |
|---|---|---|---|
| TUNBRIDGE (including Ton- bridge Wells) | 20 | ISLE OF WIGHT (including Ryde, Newport, and Cowes) | 17 |
| THANET (including Ramsgate and Margate)..... | 19 | MUTFORD (including Lowe- stoft) | 17 |
| DOVER | 21 | YARMOUTH | 23 |
| HASTINGS | 18 | NEWTON ABBOT (including Dawlish, Torquay, and East and West Teignmouth).... | 19 |
| EASTBOURNE..... | 15 | Barnstaple (including Ilfra- combe) | 17 |
| BRIGHTON | 21 | | |
| WORTHING (including Little- hampton and Arundel).... | 17 | | |

| | Deaths annually to 1,000 persons living during the ten years, 1841 to 1850. | | Deaths annually to 1,000 persons living during the ten years, 1841 to 1850. |
|--|---|--|---|
| BATH | 24 | ASHBOURNE, BAKEWELL. and CHASSEN LE FRITH (includ- ing Buxton and Matlock) | 20 |
| CLIFTON (including part of Bristol City and Bristol Workhouse). | 23 | Scarborough | 21 |
| Cheltenham | 20 | Knarborough (including Harrogate) | 20 |
| UPTON-ON-SEVERN (including Malvern). | 18 | WHITBY | 21 |
| WARWICK (including Lea- mington). | 20 | KENDALL | 20 |
| | | Aberystwith] | 18 |
| | | Bangor | 21 |
| | | Anglesey | 17 |

But it must be borne in mind, that though a good inference may be drawn of the sanitary defects of a town district, from its general rate of mortality; this latter affords but very little criterion of its natural salubrity, owing, as before remarked, to the extent to which this is liable to be interfered with by imperfect sanitary arrangements. And even in coming to any conclusion on the general healthiness of a place from its rate of mortality, several circumstances require to be taken into consideration. The rate of mortality of Brighton, for instance, is put down at 21 to the 1,000, but in this estimate no allowance is made for the large increase in the population during the season; for the number of invalids who resort to the place, and come here with dangerous and fatal complaints upon them; or for the increase of deaths over and above those belonging to the district which occur in the Hospital and Workhouse. The Registrar General acknowledges that "the number of visitors at watering places is so vague and uncertain, that he is unable to make any

positive corrections entirely to be relied on in calculating the mortality of these places." The census also is taken in the spring of the year when Brighton is comparatively empty. Most, if not all, of the smaller places mentioned in the foregoing table also include, within the area of their registration districts, rural places, which having a lower rate of mortality, proportionately affect the general result. This is the case with Eastbourne. Worthing, also includes Littlehampton and Arundel, and extends therefore over a large country district; which renders the rate of mortality lower than it would be, if the returns were confined to the town only, as is the case with Brighton.

The extent of the allowance which ought to be made, in estimating the mortality of Brighton on account of the circumstances just mentioned, may admit of some difference of opinion. Taking all things into consideration, a deduction of at least 1 per 1000 may, I think, with the greatest fairness, be made. This reduces the annual rate of mortality to 20 to the thousand of the population, taking the average of the ten years from 1841 to 1850. This is by no means a high rate of mortality compared with the other watering places of about the same size mentioned in the foregoing table; or with those of large town populations generally, which average about 24 deaths annually to 1,000. In London it is 25 to 1,000.

Taking, however, the mortality of Brighton at 20 to 1,000 of the population, this is still considerably over what the Registrar General contends is a healthy death-rate, which he estimates at 17 to 1,000, and all deaths occurring over and above this number he puts down as preventable, and arising from "impurities of the air and water." * According to this view of the subject, estimating the population of Brighton at 80,000, the number of deaths caused within the district, from the neglect of sanitary precautions amounts to 240 annually.

About six years since an attempt was made to obtain a new act for the town, without which it is quite impossible to make the requisite sanitary improvements, owing to the defective state of the present town act, but it was defeated by the determined opposition of a small section of the rate payers, combined with the general apathy of the inhabitants. Two other similar attempts have also been made more recently, but with no better success; and in the present feeling of the town authorities, there does not appear to be much probability of the desired object being attained. In the meantime other and neighbouring towns have already made very considerable improvements in their sanitary condition, having long since obtained the necessary power; and it remains for the inhabitants of Brighton to consider whether, as these facts become known to the public,

* Nineteenth Report, p. xxvi.

who are now beginning to appreciate the value of cleanliness, there is not a danger of the place being neglected for those where greater attention is paid to sanitary improvements.

In making these remarks, however, on the sanitary condition of Brighton, it is but common justice to mention that they are by no means applicable to the adjoining district of Hove, which, though possessing no advantages of climate over the adjoining parts of the town in the parish of Brighton, in respect of sanitary arrangements, presents a great contrast to it. In this part of the town (the Brunswick Square and Terrace district) there is now a perfect system of street and house drainage, cesspools being entirely abolished, or, if there be any, they form very exceptional instances. The district is also entirely free from all slaughter-houses, common lodging-houses for tramps and idlers, and all injurious trades and factories of every kind. But as respects the drainage, speaking however without any intimate knowledge of the levels, it has always appeared to me, that there is an unnecessary number of outfalls into the sea; and that at all events they ought to be carried considerably further out, to low-water mark, which might easily be done, at a very trifling expense.

It would be interesting to obtain the rate of mortality of Hove to compare it with that of Brighton; but Hove being included in the district of Steyning, I have

no means of obtaining any separate returns for that portion of it. Under any circumstances, however, it would be impossible to form any correct estimate of the mortality of Hove, owing to the rapid increase in the population since the last census in 1851. For the ten years, 1841 to 1850, the rate of mortality within the district of Steyning was 16 to 1,000, that of Brighton being 20, and the whole county of Sussex 18 to 1,000.

14.—*Sussex the healthiest County in England.*
The great salubrity of the Brighton Climate.
The unhealthy Autumn of 1858. The
exaggerated report of the presence of
Diphtheria in Brighton.

Returning from this partial digression to the subject under discussion, the natural climate of Brighton, I have already stated that, in this respect, I believe it to be unsurpassed by any other town in the country; and that were it not for its great natural salubrity, and the advantages it possesses in point of soil and position, it would suffer much more than is at present the case from the neglect of sanitary precautions. It may be interesting to the inhabitants of Sussex to know that their's is the healthiest county in England. The annexed table shows the rate of mortality during a period of ten years, from 1841 to 1850, in ten of the healthiest

and the same number of the unhealthiest counties in England. The high rate of mortality of the latter is caused by the large manufacturing populations they contain :—

| HEALTHY COUNTIES | | UNHEALTHY COUNTIES. | |
|-----------------------------------|---|-----------------------------|---|
| | Average annual rate of mortality from all causes to 1,000 persons living 1841-50. | | Average annual rate of mortality from all causes to 1,000 persons living 1841-50. |
| Sussex | 18 | Lancashire | 28 |
| Surrey (extra Metropolitan) | 18 | Surrey (Metropolitan) | 26 |
| Middlesex, ditto ditto | 19 | Kent.....(ditto)..... | 24 |
| Cornwall | 19 | Staffordshire | 24 |
| Rutlandshire | 19 | Yorkshire (East Riding).... | 24 |
| York (North Riding)..... | 19 | Ditto (West Riding) .. | 23 |
| Westmoreland..... | 19 | Monmouthshire | 23 |
| Hampshire | 20 | Cheshire | 23 |
| Berkshire | 20 | Warwickshire | 23 |
| Hertfordshire | 20 | Gloucestershire | 22 |

The extra metropolitan part of Surrey only appears to be equally healthy with Sussex. Judging from the results of sanitary improvements in other places, there is every reason to believe that the mortality of Brighton might at least be reduced to the same rate that prevails in the county generally, which even in the rural parts is not free from many artificial causes of disease, and which would be the saving of about 160 lives annually, besides an incalculable amount of attending misery and expense.

If anyone doubts the general healthiness of the Brighton climate, it is incumbent on him to state from what source the insalubrity can have its origin, excepting always those artificial and preventable causes of disease which it creates within itself. For upwards of half the year the inhabitants breathe an

atmosphere which has traversed the surface of several thousand miles of the great Atlantic Ocean. This at all events must be entirely free from all sources of disease. The staple of the land upon which the town stands, and for several miles round, is composed of chalk and sand, intermixed with flints, with the dip of the strata towards the sea, which, with the absence of any dense foliage in the surrounding district, has the effect of rendering the atmosphere of the place remarkably dry and bracing. Neither is there any low-lying marsh land, where the fresh and sea water mix and infect the atmosphere, or exposure of mud at the mouths of rivers at low tide, or, in fact, any source of malaria whatever within any distance of the town, which can possibly to any appreciable or injurious extent affect its atmosphere. The winds from the land side therefore are probably, almost, if not entirely, as healthy as those from the sea. Brighton also has no tidal harbour, nor any exposure of mud at low tide containing decaying vegetable matters, which at many sea-side places, and some much frequented by the public, is not only very offensive, but very injurious to the health. Complaints are, indeed, often made of an offensive smell from the large outfall of the drainage near the Pier; but this has diminished considerably since it has been lengthened, and probably might be prevented altogether by extending it still further into the sea. The

higher rate of mortality which prevails in the neighbouring county of Kent, which in proportion of its town and urban population, does not differ materially from that of Sussex, is probably owing to the low marshy nature of its line of coast.

But though I consider the climate of Brighton one of great salubrity, it is not pretended that it is suited for all constitutions or ailments. On the contrary, there are numbers of persons with whom, owing to certain idiosyncrasies of constitution, a marine air does not agree. Even the most valuable property of its climate, its dry and bracing qualities, renders it unsuited for some constitutions and diseases.

It is a very common opinion that scarlatina is very prevalent and fatal at Brighton, but the return of the Registrar General (see p. 132) for the four years 1854-1857, prove that this is not the case. During this period the average number of deaths from this complaint was a little under thirty annually, which taking into account the large number of young persons residing in the place, together with the large number of convalescents from the same disorder, who come to Brighton for change and to recover strength, is far from being a high rate of mortality for such a population; and if it is further taken into account that a very large proportion of these deaths occur amongst the poor, it will be readily understood that the risk to life incurred from

this complaint to the visitors, and more fortunate class of inhabitants, is very slight.

Brighton certainly, in common with nearly all other towns and districts in the southern counties, suffered last autumn (1858) from an unusually high rate of mortality, due principally to an epidemic of this complaint and small-pox. In addition to London and Brighton, the other places mentioned in the last quarterly returns of the Registrar General (p. 6), in which the mortality was "notably high, are Reading, Windsor, Great Yarmouth, Melksham; Exeter, Plymouth, and the other towns of South Devon; Bath and the towns of Somersetshire; Bristol, Gloucester, and Cheltenham," together with nearly all the large manufacturing towns of the north and north-western counties.

This excessive mortality of 1858 is stated by the Registrar General to be due, "partly to the pressure in the early part of the year on the poor in the manufacturing districts, partly to the extreme cold of November, partly to defective supplies of pure water, and partly to the prevalence of the epidemic of diphtheria." (p. 6.)

The epidemics of diphtheria and scarlatina began on the southern coast, and gradually extended over the north midland and northern counties.

The deaths registered at Brighton, in St. Peter's, or the north-central district, during the three months from scarlatina and diphtheria, were 74 of the former and 6 of the latter.

In the Palace or west-district, 30 from scarlatina and 3 from diptheria. "The Registrar for Kemp Town district has not furnished similar details."*

The most absurd and extravagant reports were circulated throughout the country of the prevalence of diptheria in Brighton, and the character of the town for health and salubrity has suffered materially in consequence. These exaggerated rumours no doubt had their origin in the first instance chiefly in the much-lamented death of a member of one of the leading families in the town. The deaths from genuine diptheria in Brighton probably did not exceed fifteen; and of this number some were imported cases, and the population of Brighton, exclusive of Hove, at this period of the year, there is every reason to believe, exceeds 85,000.

The quarterly returns are not sufficiently explicit to admit of any comparison, of the relative mortality, from this complaint, in the different districts where the epidemic prevailed; but I believe that if such could be instituted, it would be found that Brighton suffered less than the generality of other places. I have not been able to get any returns for the Brunswick Square and Terrace district; but though I have made many inquiries, I have not ascertained that there has been a single death from diptheria in that portion of the town.

* Letter from the General Registrar Office.

The very high rate of mortality of Brighton last autumn (1858) arose chiefly out of the unhealthy condition of the crowded and ill-drained parts of the town, occupied by the poor. In the St. Peter's sub-district the deaths exceeded the average by 144. "The inhabitants," observes the Registrar "of this sub-district, are chiefly artizans, mechanics, and the labouring poor. In many of their dwellings a very insufficient supply of water has been available to them owing to the dryness of the weather in the first portion of the quarter, the water in the wells in use having been very low. There is no effectual drainage attached to their dwellings, and the cesspool system is in general use."*

15.—*Advantages of Brighton as a place of residence. The relative Salubrity of Town and Country Districts. The excessive rate of Infantile Mortality amongst the Operatives of large towns. London comparatively innoxious to those whose youth has been spent in the country. The Children of the Rich not exempt from the injurious effects of the London Atmosphere. Brighton Climate particularly suited for Children and Convalescents from acute disorders.*

Of the advantages Brighton offers as a place of residence, in being the nearest watering-place to the metropolis, and the

* Quarterly return, p. 31.

rapid and easy access to it by means of one of the best conducted and safest railways in the kingdom, the facilities it affords for all educational purposes, together with the advantages usually incident to a wealthy and populous city, it is foreign to my present purpose to dilate. These are matters upon which individuals will form their own opinions, according to their particular objects in life, their general inclinations, fancies, likes, and dislikes. My present object has been simply to point out the advantages Brighton possesses in respect of the general salubrity of its climate ; and if I have been successful in this, I have proved what ought always to be the chief recommendation in the choice of a residence, particularly with a young family. Not that there are not many other places equally healthy and possessing the same general advantages as Brighton, though I am inclined to think that the constant changes of climate at the sea-side caused by the changes of the winds, which bring a marine, or land atmosphere, according as they blow from the sea or land side ; and of this place in particular in its dry soil, and the unusual freedom of its atmosphere from anything approaching to malarious emanations, have not been estimated at their due value. "Humid, confined situations," observes Sir J. Clarke,* "subject to great alternations

* Clarke on Climate, p. 234.

of temperature between day and night, are the most dangerous. Dryness, a free circulation of air, and full exposure to the sun, are the material conditions to be attended to in choosing a residence. Of all the physical qualities of the air, *humidity is the most injurious to human life*; and therefore, in selecting a residence or situation for building, in all climates particular regard should be had to the circumstances which are calculated to obviate humidity in the soil and atmosphere."

The relative advantages of towns and country districts in point of general salubrity, and the chances of life, are not probably generally understood: the impression being that in these respects the country has considerably the advantage. And if the comparison be made between the two populations, as a whole, this certainly is the case and to the extent of about 4 deaths annually to 1,000 of the population. But it must be remembered that the increased rate of mortality, at present incident to town populations, is caused by the excessive unhealthiness of the undrained and crowded districts of the poor; amongst whom, in some places, as at Liverpool, the average age at death does not exceed 15 years, and the death-rate is as high as 33 to 1,000 (caused chiefly by the excessive destruction of infantile life); and that if separate returns were made for these unhealthy parts of towns, and the less crowded and better drained districts of the rich, the results would

be very different; and it is probable that the latter would be found to present a state of health, equal, if not superior to the generality of country districts. The average annual rate of mortality, for instance, for the whole of London, is 25 to 1,000 annually. But in St. George's, Hanover Square, it is only 18, Hampstead 18, Kensington 19, Islington 19, London city 20 to 1,000; while in St. Saviours, Southwark, it is 33, Bermondsey 28, Shoreditch 28, Holborn 28 to 1,000. So in Brighton, where the average rate of mortality for the whole town is about 20 to 1,000, if separate returns were made for the districts occupied by the visitors, and richer class of inhabitants, they would be found to be much under this amount; probably not exceeding, judging from the difference in the London district, 15 or 16 to 1000. There is no reason why town populations should not be as healthy, and live as long, as the inhabitants of the country, if all undue crowding were avoided, an abundance of pure water supplied to all classes, and all organic impurities removed from the vicinity of the dwellings as fast as they are formed.

One of the most startling and deplorable facts, which have been brought to light through the instrumentality of the mortality registers, is the excessively high rate of mortality, which prevails amongst the infantile population of the country, and more particularly that of the crowded and badly ventilated districts of large towns. In London, out of

the entire deaths, nearly one-fourth are those of children under one year of age; the proportion of those who die under five years of age amounting to nearly one-half. The exact numbers in 1856 were as follows:—

| Total Deaths. | Under One Year. | Under Five Years. |
|---------------|-----------------|-------------------|
| 57,274. | 13,130. | 24,128. |

It has been ascertained that in some of the manufacturing towns, amongst the operative classes, upwards of one-half of the children who are borne, perish before the fifth year of age.

But this excessive rate of infantile mortality amongst the populations of large and crowded cities, does not represent the whole of the evil. Those who are fortunate enough to survive to the age of manhood are far from escaping the injurious effects of the impure air upon their constitutions in early life; as is evidenced in the stunted form, the peculiar sharp outline of features, the sallow complexion, and absence of that general rotundity of figure and vigour both of mind and body, which characterises the inhabitants of towns, as contrasted with those of healthy country districts. They have in fact the seeds of disease within them; and either fall victims in early manhood to epidemic, or tuberculous diseases, or verge into premature decrepitude.

Experience has shown, on the other hand, that the air of London is not injurious, or is so to but a comparatively limited extent, to those whose childhood has been spent in the country; and who go to London at the period

of manhood, in the vigour of health and strength. The truth is, that to the growing and susceptible organisation of infancy and early youth, *pure air* is as necessary as *wholesome nourishing food*, perhaps, more so; and it is therefore quite impossible that the various textures and organs of the body can be fully and healthfully developed without it. Thus it is that the fixed populations of all large unhealthy town districts degenerate in health and strength; and would doubtless ultimately become extinct from the ravages of scrofulous and epidemic complaints, were it not for the constant fresh importations from the country.

Neither are the injurious effects of the close London atmosphere confined to the poorer inhabitants. All the care that is bestowed upon the children of the wealthier classes will not compensate for the absence of pure country air; and though they may more successfully run the gauntlet of the various infantile complaints, they experience the same evils in a more mitigated form in after-life. This truth is, now beginning to be more fully appreciated by town populations: as may be seen by the much larger number of children who are sent to school in the country; or whose parents think it necessary to leave London every year for change. But a few weeks in the country, though doubtless of great service, will not counteract the evil effects of a much larger proportion of time spent in London;

and for those families accordingly who are compelled to reside there the former is by far the best plan. Much advantage would doubtless accrue to the London population, if the various public schools were removed to healthy suburban districts, and their present sites disposed of for other purposes.

The air for children should be dry, of as equable a temperature as possible, and, above all, free from malarious exhalations: to the injurious effects of which the tender constitution of early life is more peculiarly sensitive. Brighton has been considered, it would seem by almost common consent, whatever may be the opinion of its climate in other respects, a suitable place of residence for children, as is evidenced by the extraordinary number of schools which are established in the place, and the crowds of children which daily, in fine weather, throng the beach. Sea-air, indeed, invariably agrees with children; and the dry bracing air of Brighton, the quickness with which the moisture dries up after rain, enabling them to be a great deal out in the open air, gives it an advantage in this respect possessed by but few other places in the country.

The general salubrity and dryness of the Brighton climate, also renders it suitable for that numerous class of people who, without any decided disease, require simply a change of air and scene, as a relaxation from study or the anxieties of business; as well as for the generality of convalescents from acute

diseases, whom either convenience or choice may tempt to the place.

As a general rule, when change of air only is required, some place should be chosen which, in the general characters of its climate and scenery, offers the most decided contrast to those of the place the individual has been accustomed to reside in. Thus, those who have been living at the sea-side ought not certainly to go to any other sea-side place, but to some healthy inland district. And, *vice versa*, those who reside in inland places, and particularly if it be in the close atmosphere of a large town, would derive more benefit from a change to the fresh and invigorating atmosphere of a healthy and cheerful place on the sea-coast. Well would it be for business men, and those engaged in hard study, if they sought for change at shorter intervals, if it were only for a day or two, instead of putting it off until necessity compels them to leave. It is astonishing what good, under these circumstances, by changing the current of thoughts and ideas, even a few hours will do at the sea-side. If this plan were more generally followed, much ill-health, disease, premature decay, and senility would be avoided, and many valuable lives prolonged many years.

- 16.—*Sanitary Properties of the Brighton Climate. Strumous or Scrofulous Affections of Children and Young Persons. Necessity of a prolonged sojourn in the place for the cure of these Complaints. The best period of the year for Scrofulous Disorders. Remarks on the Hygienic Management of Delicate Children. Medical Treatment in the Strumous Diseases of Children.*

As respects those diseases in which in a sanative point of view, the climate of Brighton has been found serviceable, those generally classified under the term, strumous, or scrofulous, are usually considered as occupying the first place; and it is interesting to know, that it was in the cure of these complaints, chiefly in young persons, that Brighton was first brought into notice by the late Dr. Russel in 1753.

In popular estimation, the term scrofula is more frequently associated with the disease as it shows itself in the external system of glands, more particularly those of the neck, which are the most frequently affected; but it need hardly be mentioned, that the scrofulous diathesis does, in reality, show itself in a much greater variety of forms, including many of the most troublesome and fatal complaints to which childhood is subject.

The tonsils, the mammary, the bronchial, and mesenteric glands, are frequently the

seat of the tubercular deposit, and the two latter, bronchial phthisis and *tabes mesenterica* (*mesenteric phthisis*), with the exception only of pulmonary consumption, are the most incurable of all the forms which scrofula assumes.

Many troublesome and stubborn affections of the skin and cellular tissue, particularly the poriginous and eczematous affections of infancy and childhood, lupus, superficial ulceration and abscesses of the skin and cellular tissue, and those of a more serious kind, connected with disease of the joints and bones, as psoas and lumbar abscess; also, a very common affection in delicate children, caused by thickening and induration of the skin and subjacent cellular tissue, most frequently noticed in the upper lip and nose, causing the well-known tumefaction of these organs; have all, no doubt, in a greater or less degree, a scrofulous origin.

The mucous membranes, likewise, very frequently become the seat of disease in consequence of a scrofulous taint of the constitution. In children the mucous lining of the stomach is the most liable to disease from this cause, constituting the complaint, well known to medical men, called strumous dyspepsia: a very insidious and dangerous form of disease; and is considered indeed by some eminent authors as more strongly indicative of the strumous diathesis than almost any other complaint usually ascribed to this source. It shows itself in a capricious appetite: generally

there is no desire for food ; at other times the appetite is voracious ; but the functions of digestion are feeble ; and the system is as badly nourished as in those who take too little food. The child is fretful and peevish, of a languid retiring disposition, pasty complexion ; the nights are restless and the sleep unrefreshing ; the bowels are generally constipated, alternating with occasional attacks of diarrhœa, with a deficiency of bile in the evacuations. The tongue is generally florid, though in the later stages of the complaint it becomes furred, and the breath offensive. The child frequently changes colour, is liable to red patchy eruptions on the face, to poriginous and eczematous eruptions on the head and behind the ears : is in fact never entirely free from some ailment or another ; and unless attended to, matters go on from bad to worse, until at length the complaint shows itself in some of the more unmistakable and outward signs of scrofula.

To the class of strumous complaints also belong many of the forms of ophthalmia, or inflammation of the outer coats of the eye in children ; otorrhœa or purulent discharges from the ear (a frequent sequence of the eruptive fevers in unhealthy children), also mucous and purulent discharges from the nostrils and vaginal membrane : the latter a not uncommon complaint in scrofulous children, and one that frequently gives rise to much anxiety.

The osseous system likewise frequently becomes the seat of disease by virtue of the

scrofulous diathesis. The bones most liable to the disease, are the spongy bones of the nose (which is generally to be feared when there is any long continued and obstinate purulent discharge from the nostrils); those composing the wrist and ankle joint, and bodies of the vertebræ, which latter is the cause of those unsightly distortions of the spine, so frequently witnessed amongst the inhabitants of large towns, and is frequently associated with psoas abscess; also the ends of the long bones of the arm and leg, known as white-swelling, the iliac bones, and head of the femur, constituting the common hip-joint disease.

There is also little doubt, that hydrocephalus, (*water on the brain*,) in both the acute and chronic form, convulsions, and many other intricate and dangerous affections of the nervous system, are more or less connected with, or have their origin in, a scrofulous taint of the system.

In the cure of all these complaints, in a greater or less degree, the Brighton air has long justly enjoyed great celebrity. But as respects these diseases, more particularly, it is necessary to repeat the caution, mentioned in a former part of the work, that in order to derive any permanent good from the effects of the climate, it is necessary that the patient's residence in the place should be prolonged for several months, and repeated annually. The stay of a few weeks, no doubt, is often attended with considerable immediate

benefit; but the improvement does not last, and the child soon retrogrades to its former state, on being exposed to the influences which brought on the complaint. The best period of the year at Brighton for children suffering from these complaints is from June to the end of February. The spring months at the sea-side are not favourable for delicate children; and those who reside here will do well to remove during this period of the year to some healthy inland district. I consider the summer months, June, July, and August, owing to the greater prevalence of the south-west winds, and consequently more marine state of the atmosphere, in a remedial point of view, in the generality of the diseases of children, equal, if not superior, to any other period of the year; always bearing in mind the precautions formerly mentioned, especially necessary in scrofulous children, of not allowing them to be exposed to the effects of the sun during the middle of the day in hot unclouded weather. Some care, in fact, is always required on first coming to Brighton, particularly in the case of children who have been accustomed to an in-door life, in regulating the time for out-door exercise, and exposure to the sea-air, as the too sudden change in the habits of life is very liable to derange the health, and obviate for some time the good effects which would otherwise follow a judicious use of the climate.

It cannot indeed be too strongly impressed

upon the minds of all who have the care of children, that though change of air and scene will generally be attended with the most satisfactory results, yet in their case more especially too much reliance must not be placed upon any supposed specific properties of the climate, to the neglect of the ordinary hygienic rules and remedial measures which, under other circumstances, are considered necessary.

It would be quite foreign to the object and scope of the present work to dilate upon the all-important subject of the hygienic management of children; but the following remarks, having reference to some matters which are often overlooked in going to strange places; and the neglect of which is very often the cause of the want of success attending the change of air, may not be out of place.

In the first place it is essential, that the house selected be properly drained; and if possible not in the immediate neighbourhood of any densely crowded unhealthy district. It must be acknowledged that the observations of the Registrar General in his last Report (p. xxiii.) on the defective drainage of most watering places, is too true; and the older parts of Brighton, and those inhabited by the poor are, to say the least, no exception to the general rule. The tender organization of children is much more sensitive than that of grown up people to the injurious effects of an impure atmosphere; and there can be no question, and many instances have come under my own

notice, where not only has no benefit been derived from the change to Brighton, in consequence of living in a badly drained house, but that serious illnesses and contagious fevers, which by some are attributed to unhealthiness of the climate, have arisen from this cause.

The nurseries and sleeping apartments for children also require attention in the selection of a house; for the latter are dark and badly situated with respect to ventilation in the general run of lodging-houses of the town. But here it may be remarked that the purity of the atmosphere of a sleeping room depends more upon the means used to ensure ventilation, or a constant admission of fresh air into the room, than upon the numbers sleeping in it. However large the room may be, or however few the occupants, if every crevice is stopped up throughout the night, the air will certainly be close before the morning; while with proper means to ensure ventilation, a much smaller and more crowded room may be kept comparatively sweet and airy. It is never safe to trust to the statement of nurses in this matter; and the time to test the state of the atmosphere of a sleeping-room is to go into it early in the morning, before the children are out of bed. The most simple, and, perhaps, the most efficacious way to ensure ventilation, is to keep the register of the stove up; and the door partially open throughout the night. This precaution is more particularly necessary in

all schools or dormitories of any kind, occupied by several persons, and when attended to, and the apartments are not unduly crowded, it will seldom or never fail to prevent any injurious closeness of the atmosphere.

The diet of course requires regulation according to the habits and constitution of the child. As a general rule in scrofulous and unhealthy children, a meat diet is desirable, as being the most nourishing and easily digested; but I cannot help expressing my conviction, that the tendency of the profession at the present time is too much in this direction. At all events I am quite certain, that the rich stimulating diet recommended by the London medical men, however necessary it may be in the close depressing air of the metropolis, is not, as a general rule, suitable in the more bracing and invigorating air of Brighton.

As regards the utility of medicines in these cases, much difference will be observed in different cases and constitutions. In a very large proportion of cases no doubt the beneficial effects derived from the change of air, aided by the requisite attention to the ordinary hygienic rules, will suffice to restore the health, with little or without any assistance from this source; but at the same time I am equally certain, that in many cases medicines are absolutely necessary; while in by far the largest proportion their judicious exhibition will expedite the cure. All indiscriminate

dosing, however, especially with calomel, cannot be too severely reprobated in all children in whose constitutions there is the slightest cause for suspecting any scrofulous tendency. In my own practice in this description of cases I have seen more good derived from the syrup of the iodide of iron, than from any other single remedy with which I am acquainted. It may be given in doses of from ten to thirty drops, according to the age of the child, twice a day, either in water, or if the appetite be bad, in two or three drachms of the infusion of *quassia*. When the liver is inactive, which very frequently happens, two or three grains of hydrargyrum c. cretâ, *grey-powder*, may be given every other night for a week or ten days, until the excretions assume a more healthy appearance. Sometimes, however, a single dose of calomel will be more efficacious in exciting the liver to action, than a great many doses of the milder medicine, and when this is found to be the case, it should of course be preferred; but, at the same time, it is seldom safe to give these more powerful medicines, excepting under medical advice and supervision. These medicines have the advantage, at least when the syrup is given in water, of being readily taken by young children, and the grey-powder and calomel, being in a small bulk, and tasteless, can generally be administered without the knowledge of the child.

The favourite remedy, cod-liver oil, is also doubtless frequently of great service in these

cases, but there are many delicate stomachs with whom it does not agree.

There are also two other precautions which it is absolutely necessary should be attended to in children suffering from scrofulous complaints, or with any scrofulous predisposition, which are: to refrain from all over-teaching; and to be careful in the use of warm clothing in, as well as, out of the house.

17.—*Complaints consequent upon an impoverished condition of the Blood, and general Atony of the System, common in Young Persons.*

Another very important and extensive class of complaints in which, in a sanative point of view, Brighton air has long justly enjoyed great celebrity, are those which have their origin in, and are connected with, an impoverished condition of the blood, characterized by great paleness of the surface, defective appetite and feeble powers of digestion, with a general relaxed, languid, and torpid condition, of all the mental and bodily powers. Young women are more especially liable to this condition of the system, and with them it is invariably associated with,—either as cause or effect, but generally the latter,—some irregularity or delay in the uterine functions; and which though generally curable if taken in time; if neglected and allowed to run on, invariably ends sooner or later in some organic incurable complaint.

Sir James Clarke (p. 130) has aptly and correctly indicated the class of complaints here alluded to, as those in which iron is generally found serviceable, in which, as well as in convalescence, from acute diseases, and the debility consequent upon long confinement, no sea-side place with which he is acquainted is to be compared with that of Brighton.

Some of these cases will derive more benefit from a dry, and bracing, others from a milder, and softer, air. The latter should always be preferred when there is any delicacy of the chest, or any fear of a phthisical predisposition. But in the great majority of cases of delicacy of constitution in young women, where the chest is not materially affected, a tonic, bracing, atmosphere is the most suitable. The latter description of cases should seek a residence on the East Cliff, or some of the more elevated parts of the town, the former the valley of the King's Road, or the parts between the Western Road and the sea. With the exception of those cases which are complicated with chest affections, when the spring months at the sea-side should be avoided, my impression is that there is no period of the year during which benefit may not be derived from the Brighton air in this class of complaints.

18. — *Agues. Chronic Bronchial Affections. Relaxed Sore Throat. Asthma. Dyspepsia. Bilious Headaches. Constipation. Dysmenorrhœa. Menorrhagia. Leucorrhœa. Apoplexy. Inflammatory Affections of the Brain. Chronic Pleurisy. Empyema. Convulsions in Children. Hooping Cough. Ophthalmia. Skin Complaints.*

The dryness and freshness of the Brighton air, and its singular freedom from marsh malaria, renders it peculiarly suited to all complaints which derive their origin from this state of the atmosphere. These cases invariably, unless complicated with some organic disease of the viscera, yield to the ordinary plan of treatment in Brighton; and that often, when before coming to the place all medicines had proved unavailing, or of only temporary service. A long residence here, however, is required, thoroughly to eradicate the seeds of these complaints from the system, in those cases in which a prolonged sojourn in an aguish district, has given the complaint a firm hold on the constitution. Unless there be any delicacy of the chest, or other contra-indicating symptoms, I should give the preference to the East Cliff in these complaints; and any part of the year is suitable for them.

The dryness, mildness, and general qualities of the Brighton air likewise render it beneficial in the chronic inflammatory affections and irritations of the mucous linings

of the bronchial tubes, air vessels, trachea, and larynx ; and the variety of climate the place affords, more especially as respects its tonic or bracing qualities, and its temperature, renders it suitable in a correspondingly large variety and forms of these complaints. The East Cliff will be found generally to agree best with those forms of the complaint which are attended with a copious expectoration, and a debilitated relaxed condition of the system : the valley of the King's Road and adjoining parts, with those cases in which a dry irritating cough is the predominant symptom. In the more inveterate kinds of the latter form of these complaints, however, the milder and more humid atmosphere of Torquay and the south-coast of Devonshire and Cornwall will generally be found the most efficacious.

The relaxed sore throat, so frequently met with amongst clergymen, usually derive great benefit from the bracing air of Brighton ; but as these cases are, with but few exceptions, either associated with, or dependent upon, a weak, languid state of the system, a prolonged stay of several months will generally be required to effect a permanent cure.

Asthma is a very uncertain complaint, as respects the kind of atmosphere that agrees with it. Some asthmatics find themselves better in the close, confined air of London ; others in the moister and more relaxing climates of the south-west coast ; while with others again the bracing and more circulating atmosphere of this place is found the most

suitable. Much difference also will be found in the different parts of Brighton in the influence they exert over individual cases of this complaint.

The only forms of dyspepsia that generally get any benefit from the Brighton climate are those of the atonic kind, arising out of a debilitated and relaxed state of the system. Some cases of what are called nervous and irritable dyspepsia, occasionally do well in the milder and sheltered parts of the town; but the softer and more relaxing climates of the south-west coast generally agree better with this description of cases. Gastritis, or inflammatory dyspepsia, and indigestion arising from a defective secretion of bile are almost invariably aggravated by a residence at Brighton. Dyspepsia, however, is one of those complaints which is generally more benefited by constant changes of air and scene than by a prolonged residence in any one climate in particular.

Persons also who suffer from what are called bilious headaches, constipation, dysmenorrhœa, will generally find their complaints aggravated by the Brighton climate. Cases of menorrhagia and leucorrhœa, on the other hand, will as generally derive great benefit from it.

All persons of a full, irritable, habit of body, particularly if predisposed to apoplexy and inflammatory affections, had better generally seek a more soothing milder place. It must be understood, however, that

apoplexy, as well as inflammation, have their origin as frequently, perhaps more so, in a debilitated state of the system, and an impoverished condition of the blood, as in the opposite cause of fullness, or excess of health, and that in all such cases the air of Brighton is peculiarly suited. Weak debilitated persons affected with paralysis likewise generally improve in this climate, as do also chronic cases of pleurisy with effusion.

Children liable to convulsions, or acute inflammatory attacks of the brain, when dependent upon, or associated with fullness, or excess of health, are generally safer in an inland climate. In the latter stages of hooping cough Brighton air may be considered almost as a specific.

It is also the opinion generally of medical men, and one in which I certainly coincide, that Brighton is not suited for any of the inflammatory affections of the eye; on the contrary, they will be found to be invariably aggravated by it, and in bright weather the glare from the sea is very distressing. Persons also who suffer from a dry irritable state of the skin will generally find themselves more comfortable in a moister climate.

19.—*Pulmonary Consumption. Causes of the Complaint. Climate less causative of Phthisis than is generally supposed. The disease equally as prevalent in all other European Countries. The Constitutional or Premonitory stage of Consumption. Brighton considered as a Place of Residence for Consumptive People. The doubtful superiority of foreign climates over those afforded by our own country in this complaint.*

There is no complaint, considering its prevalence, and the mortality it occasions, respecting which the unprofessional community are less informed, or entertain more erroneous views, than pulmonary consumption. The deaths from this complaint, in England and Wales alone, average upwards of 50,000 annually. For the three years 1854 to 1856, they were respectively 51,284, 52,290, and 48,950, being equal to about one-eighth of the total deaths.

The simple fact of this immense mortality from consumption is a sufficient proof, if none other were wanting, that it is a complaint which is but little under the control of medicine. In its advanced stages indeed, after the tubercles have undergone the process of softening, and cavities have formed in the lungs, though, by a judicious line of treatment, the disease may be materially arrested in its progress, the chances of ultimate recovery are so

small, as barely to admit of any hopes being held out to the patient. In quite its earliest stage, and before the complaint has located itself in the lungs, there can be no doubt that it may be often warded off for years, and not unfrequently finally eradicated from the system; but unfortunately, owing to its slow and insidious approaches, it is seldom that medical aid is sought until the disease has reached those stages which set all human aid at defiance.

But though many cases of consumption might be cured, and a still larger number arrested in their progress for years, by an earlier resort to remedial measures, there can be no question, that it is only by way of prevention: by avoiding those causes and habits of life, which recent investigations have shown lead most materially to the development of tubercular disease: that any satisfactory progress can be made in diminishing its present fatal ravages.

Here again medicine is at fault, for it is seldom that medical men are consulted in the choice of a profession or occupation by the upper classes; while with the poor their occupations are invariably rather matters of necessity or accident, than of choice; and are, moreover, conducted under circumstances over which they themselves have little or no control; and in the regulation of which the lights of increasing knowledge have hitherto exerted but a trifling and exceptional influence.

There are two points therefore connected with pulmonary consumption upon which it is essential that the community at large should be better informed: the first is—some knowledge of the symptoms which accompany the commencement of the complaint, in order that medical aid may be sought before all hope of recovery has passed away; and secondly: a knowledge, with a view to their prevention, of those causes which experience has shown are productive of tubercular disorders.

Without, therefore, for an instant, pretending to write anything approaching to a medical disquisition upon pulmonary consumption, a few observations upon these two particulars connected with it, though certainly not strictly within the compass of the object of this work, may not, I trust, be thought out of place: hoping, that by so doing, some information may be disseminated, which, under Providence, may be the means of contributing, however slightly, to some mitigation of its present fatal ravages.

With respect to the causes of pulmonary consumption it is especially important in the first instance to bear in mind that it has powerful hereditary tendencies: any acquired liability to the complaint on the part of the parent is invariably, in a greater or less degree (in proportion as the other circumstances in which the individuals are placed are more or less healthful: lead more or less to the development of the scrofulous diathesis) communicated to the offspring; so that the

evil is not confined to the generation that gave it birth, but extends to succeeding ones. "Whatever," observes Mr. Simon, "tends to increase tubercular disease among the adult members of a population, must be regarded as assuredly tending to produce a progressive degeneration of race."*

Owing to the difficulty which exists in getting any reliable information beyond the preceding generation, it is impossible to form any, even approximative, estimate, of the proportion of cases of phthisis which owe their origin to hereditary influences, but judging from the number of those in which the taint is clearly derived directly from the parent, there can be no question that the proportion of such cases is very large, and much greater than from any other single cause. As will be readily understood, the predisposition to consumption is much increased in the offspring when the tubercular diathesis had previously existed in the families of both parents, and particularly when there is any consanguinity between them. These latter cases indeed, are the most rapid and intractable with which the physician has to deal; and under such circumstances, it is not uncommon to see whole families cut off one after another, notwithstanding the strictest avoidance of all the known exciting causes of the complaint. It is in fact chiefly owing to this cumulative

* Preface to Dr. Greenhow's Report to the General Board of Health, p. 22.

hereditary tendency of tubercular diseases, that the marriage of near relations is so objectionable.

Of the causes to which consumption in the first instance owes its origin, there is much that requires investigation. Sufficient information on the subject, however, has been obtained to show that they are to be sought for chiefly in the industrial occupations of the people: that though scanty, unwholesome, or inappropriate diet, insufficient clothing, over-taxed powers of body or mind, vicious and intemperate habits, in fact whatever deteriorates the health and impoverishes the blood, contributes to the development of phthisis; it is in those occupations and habits of life, connected with the breathing of an impure atmosphere and imperfect ventilation of apartments and workshops, that the tendency to the complaint shows itself in its greatest intensity. "In proportion," observes Mr. Simon, "as the male and female populations are severally attracted to in-door branches of industry, in such proportion, other things being equal, their respective death-rates by phthisis are increased."*

Though the agricultural labourer is worse fed, worse clothed, worse housed (at all events as respects the internal warmth of his dwelling), more exposed to inclemencies of the weather, he is less liable to consumption than the corresponding inhabitants of large towns;

* Dr. Greenhow's Sanitary Report. Preface, p. 22.

and the death-rate from phthisis of the latter is increased, other things being equal, in proportion to the density of the population, the defective state of the drainage, and the neglect of the removal of organic impurities from the vicinity of the dwellings. Liverpool possesses the unenviable position of being the unhealthiest town in the kingdom, and it is there that the mortality from pulmonary complaints is the highest.

It has also been ascertained that the artisan : tailors, shoemakers, compositors, engravers, milliners, domestic servants, &c., who, particularly domestic servants, live better, and whose work is less laborious, but who pass the greatest part of their time in ill-ventilated, dark and gloomy apartments, are much more liable to consumption than out-door labourers ; as cabmen, grooms, porters, gardeners, and others similarly employed, whose exposure to the inclemencies of the weather would, it might have been, *a fortiori*, expected, have rendered the reverse the case. With the exception, perhaps, of those trades which unavoidably cause the inhalation of dust, or other irritating and noxious particles, as needle-grinding, stone-masonry, mining, &c., there is every reason to believe that it is not so much the occupation itself which is so productive of tubercular complaints, as the impure atmosphere which those who follow them are compelled to breathe ; and even as respects the trades last mentioned, there is

little doubt that if the ordinary rules of health in all other respects were generally observed, the injurious effect of the inhalation of the noxious particles would be comparatively trifling.

It is a matter of notoriety, that the mortality in the army, and particularly the Guards, from phthisis and other pulmonary complaints, is excessive, and much greater than amongst the labouring classes in civil life; and the conclusion arrived at by the Commissioners appointed to enquire into the sanitary condition of the army is, "that the ravages committed in the ranks of the army by pulmonary disease are to be traced, in a great degree to the vitiated atmosphere generated by overcrowding and defective ventilation, and the absence of proper sewerage in barracks: this one cause acting with such intensity, especially when superadded to a certain amount of exposure as not only to produce in the Foot-Guards an amount of the disease in question, which is greater than is produced in civil life by all the four causes" (viz., insufficient clothing, insufficient and unwholesome food, sedentary and unwholesome occupation, and the vitiated air of unhealthy dwellings) "united, but which actually carries off annually a number of men in the infantry nearly equalling, and in the Guards actually exceeding, the number of civilians of the same age who die of all diseases put together."

Owing to the great want of information respecting the geography of phthisis, it was formerly the impression, even of medical men, that the disease derived its origin chiefly from some peculiarity of climate; and that the damp and changeable climate of the British Isles was more particularly productive of this class of disorder; while in the warmer and brighter skies of more southern latitudes, the disease had no place. This idea still lingers amongst the unprofessional part of the community; and hence the intense desire so often experienced by phthisical invalids to go to those supposed favoured climates, under whose benign and favoured influence they vainly expect to recruit their wasting health and strength.

There is indeed every reason for believing, —owing to the greater activity of the function of the lungs in the colder climates in order to maintain the necessary amount of animal temperature, thereby causing a more rapid flow of blood through these organs,—that phthisis, in common with other pulmonary disorders, is more frequent in the cold and temperate latitudes than in those within the tropics, where the biliary and cutaneous functions predominate. Yet recent investigations have fully proved that there is no climate where the evils formerly alluded to, entailed on society by a higher degree of civilization, exist, which is free from this dreadful scourge; and that in fact in many of the far-famed spots for

phthisical invalids (the South of France, every part of the Italian Peninsular, Spain, Portugal, the West Indies, &c.), the mortality from consumption is as great as, if not greater than, in this country. It is even asserted that in Madeira, the "city of refuge," "phthisis is frequently met with amongst the natives, who are, generally speaking, a highly scrofulous community."* Dr Greenhow, in the course of his investigation into the causes of pulmonary diseases, observes that "Cold alone is less causative of pulmonary diseases than is commonly supposed. Let me not here, however, be misunderstood. I do not mean to assert that cold and atmospheric vicissitudes are not amongst the most powerful exciting causes of pulmonary diseases in the delicate or the predisposed; I only mean to infer, that apart from personal predisposition, they are much less dangerous than is usually believed."† In an interesting work lately written by Dr. Murrhry, of Leipzig, *On the Influence of Climate on disease*, it is asserted that phthisis diminishes in the rarefied atmosphere of mountainous regions, and that this diminution commences at an elevation of 4,500 feet above the level of the sea, and continues to a height of 10,000, at which altitude the disease disappears altogether. This absence of pulmonary consumption in elevated situations is attributed to the rarefied conditions of the atmosphere,

* Cotton, on Consumption, p. 244.

† Sanitary Report, p. 50.

and the consequent greater expansion of the lungs in respiration. Should this turn out to be the fact, it will probably lead to an entire change in the climatic treatment of the earlier stages of many of the forms of consumption, and instead of Madeira and the southern countries of Europe, physicians will be found sending their patients to the mountainous regions or table-lands of Mexico, South America, or perhaps Switzerland. And, as a general rule, it would doubtless seem more reasonable to send consumptive persons to those climates where the complaint does not exist, instead of those where it is probably as prevalent as in this country, if not more so. At the same time it would appear doubtful whether the immunity from consumption enjoyed by the inhabitants of mountainous districts, may not be due rather to their more hardy outdoor life than to any particular quality of the atmosphere; as in quite its opposite state as to pressure, at the level of the sea, as in the Ferroe Islands, and on the coast of Iceland, where the habits of the people are simple, consumption has been found to be a very uncommon complaint.

The nature and scope of my work will not permit me to go further into this interesting and generally much misunderstood subject, of the geography of phthisis, and, for further information upon it, I must refer my readers to the works of the authors just mentioned, where they will find much interesting and

valuable information, though a good work on the subject is still a desideratum.

It was this erroneous impression respecting the climatorial origin of phthisis, which led to the injurious practice still too frequently persisted in by unprofessional people, of keeping delicate children, in whom there is any fear of consumption, to a too exclusively indoor existence during a great part of the year; and even of confining them to one room, kept up, by artificial means, at a certain uniform temperature, and from which the admission of pure air from without is excluded by every possible contrivance. The truth is, that children who have any tuberculous predisposition, under the ordinary restrictions as to clothing, the avoidance of wet, and a too lengthened exposure to a low temperature, should as early as possible be accustomed to out-door exercise, and to bear the ordinary vicissitudes of the weather and changes of temperature. The ventilation of the nurseries, school-rooms, and sleeping apartments, under these circumstances, should also be a special object of study.

Whatever may be the result of the above plan, one thing is very certain, that a coddling, hot-house existence will not have the effect of warding off tubercular consumption, where the hereditary predisposition to it exists; coughs and colds may certainly thereby to some extent be avoided, but the lungs will become

tuberculous nevertheless; and though a judicious hardening system may also fail, it will give the best chances of success.

The same plan should also be followed as age advances, and those employments should be sought, which combine moderate activity of mind and body with out-door exercise.

The other point to which we have to direct our attention is the diagnostic signs of the first, or preliminary stage of consumption. The mistake generally committed by unprofessional people, is in regarding phthisis as a local, instead of a constitutional disorder: in directing their whole attention to the affection of the lungs, and overlooking that constitutional disorder which always precedes and accompanies it. Pulmonary consumption, indeed, does not consist simply in the deposition of tubercles in the lungs—though this is certainly generally the immediate or proximate cause of death—but in some previously existing morbid condition of the system, probably of the blood, of which the tuberculous deposit is the result, and which hold the relation to each other of cause and effect.

As before remarked it is in this preliminary stage of the complaint *only*, before the lungs are implicated, that any decided benefit can reasonably be expected from remedial measures; and it is therefore of the greatest importance, that the symptoms by which it is accompanied, should be fully understood. This is the more necessary, as they are not

always very defined, or at all events their access is so stealthy and their progress so slow, that though they may be sufficiently obvious to an experienced observer, they are very apt to be overlooked by the patient himself, as well as by the members of his own family by whom he is more immediately surrounded; and it is only when some of the more severe symptoms, which characterize the latter stages of the complaint, and the actual deposition of tubercle in the lungs, as spitting of blood, cough, expectoration, great loss of strength; when in fact all hope from remedies is past; that the patient himself or his friends, become really alive to his condition, and medical aid is sought.

The following are the symptoms by which the premonitory stage of consumption can be generally distinguished, being more or less marked and varying in duration in different cases. A young person, previously in the enjoyment of good health, without any assignable cause, unless it be a slight cold, gradually loses strength, and is compelled to give up some of his more active habits and employments. He does not complain of anything in particular: there is generally no very prominent symptom, no pain, and there is no part or organ of the body which shows any decided signs of disease. But at the same time there is a general feeling of uneasiness and discomfort which shows itself in an unevenness and irritability of temper, capriciousness of the appetite, restless nights, or, at all events,

unrefreshing sleep, frequently accompanied with perspirations. He loses flesh, the countenance is alternately depressed and excited, his movements are hurried and anxious, the pulse slow and small, but together with the breathing is readily excited by any exertion, or any sudden mental emotion or surprise. This tendency to dyspnæa on exertion is, I believe, one of the most constant accompaniments of the premonitory stage of phthisis. The complexion gradually loses the hue of health, and assumes a pallid, or sallow and patchy, or blotched appearance (caused by a fixed, abrupt colour in the cheeks), combined with a certain and varying amount of lividity of the lips. The extremities are cold, the digestive powers feeble, the bowels are uncertain, generally inclined to be costive, with occasional attacks of diarrhœa. There is generally no cough, or if there be any, it is a dry nervous, irritable sort of cough, and comes on chiefly after exertion, or any embarrassment of the circulation; hence it is, that the patient, and his friends, are so often deceived as to the real nature of the complaint. There is almost always a great liability to "colds" from comparatively slight or inappreciable causes.

Whenever these symptoms supervene, particularly if there be any reason to suspect any hereditary predisposition in the family, there should be no delay in having recourse to all those remedial measures which the increasing experience of the day has shown to

be useful in checking the progress of the disorder and restoring the balance of the circulation; for in proportion as they are had early recourse to, will the chances of their success be increased.

It now only remains for us to take into consideration, to what extent Brighton is suitable in pulmonary consumption. The general impression certainly is, that it is not adapted to this complaint, and I do not find, in any of the more popular works on consumption, Brighton mentioned as a resort for phthysical invalids. But this, probably, has arisen from some mistaken notion of the properties of its climate: from the supposition that every part of the town agrees in the chief features of its climate with those well-known properties which are ascribed to the East Cliff and the other more elevated and keener portions of the place; and which in a former part of the work I have attempted to prove differ more from the valley of the King's Road than do the climates of the generality of places many miles distant along the same line of coast. I quite agree in the opinion that, with few exceptions, the elevated and colder parts of the town do not agree with consumptive people, and still less with those in whom the complaint has reached its more advanced stages; but, at the same time, I am equally certain that these objections do not apply to the warmer and more sheltered portions of the town; and that here the con-

sumptive invalid, and particularly those in whom the predisposition only exists, or those in whom the complaint has not advanced beyond quite its earliest stages, may reside during a great portion of the year with as much advantage as in any other place in the country.

The results of more recent experience of the effects of climate in pulmonary consumption, together with the greater amount of knowledge we now possess of the nature, causes, and general treatment, of this complaint, all tend to show that a close, relaxing, damp atmosphere is not generally favourable to phthisical invalids, particularly in the earlier stages; and that more benefit is, on the whole, derived from a moderately bracing, dry, and invigorating climate, provided it be mild and equable, which are the qualities of climate possessed by the warmer and sheltered parts of Brighton, in perhaps, a greater degree than any other place in the country. Dr. Cotton* thinks that in the earlier stages "when the strength is yet tolerably good, and the cough not excessive, the usual resorts of consumptive invalids, such as Hastings, Ventnor, and Torquay, should be avoided; for besides the too great mildness of such places for those who may still be able to bear a more bracing locality, the daily sight of others more advanced in the same disease, very often tells sadly on the

spirits." * * * "A bracing but not bleak air is at this time by far the best, whenever it can be borne."

Without attempting to enter into any discussion upon the important question of the relative merits of foreign climates, and those of our south and south-west coasts in pulmonary consumption, the fact is certain that recent experience has, to say the least, very much shaken the belief of professional men in the formerly much-vaunted superiority of foreign climates in this complaint. Sir James Clarke, the great authority in these matters, speaks confidently of the benefit derived in the earlier stages of the complaint from travelling abroad, and passing the winter in some mild foreign climate, giving the preference to Madeira; but is decidedly of the opinion that "when consumption is fully established" * * * "the patient will act more judiciously by contenting himself with the most favourable residence which his own country affords."* Dr. Cotton, † a more recent writer on consumption, while admitting that the health, in the earlier stages, is often benefited by a residence in a well-selected foreign climate, states it as his "firm belief that the same effect might equally have been gained in these cases, *could the patients have been induced to think so*, by the judicious selection of some place in the

* Clarke on Climate, p. 51.

† Page 254.

southern parts of England." Dr. Thompson, also a recent writer on the same complaint, observes, "In the recommendation of climates as appropriate to particular patients, I cannot but think that undue importance has been attached to trivial differences of temperature."*

The close sheltered and relaxing places on the sea coast, generally recommended for phthisical invalids, may certainly be more pleasant to the feelings, which are generally very susceptible of cold, but it is a question whether the disease of the lungs does not make more progress in an atmosphere of this kind than in one of a more bracing, invigorating nature. The fact that pulmonary complaints are much more prevalent in Cornwall, where the climate is eminently mild and relaxing, than in Durham: a cold bleak country, and particularly exposed to the north-east winds, though the proportion of the mining and agricultural population is the same in both counties; also that Lincolnshire, likewise a keen and bleak climate, is freer from the same complaint than any other county with a similarly employed population, over which recent investigations have extended,† is a sufficient proof that the relaxing and milder climates of the south-west, though they may be more suitable in exceptional cases, do not possess

* Clinical Lectures on Consumption, by Dr. Theophilus Thompson, p. 189.

† For further information on this interesting subject I must refer my readers to Dr. Greenhow's Report, p. 25.

any general superiority in consumptive diseases over the colder, drier, and more bracing air of the more eastern districts of the country.

Recent investigations, indeed, go far to disprove the idea, that climate exerts any specific influence in tubercular complaints. The benefit consumptive people derive from travelling and change of climate, may, with a much greater show of reason, be attributed to the recreation, diversion, the out-door exercise and general change in the habits and associations which they afford. Particular constitutions, and differently constituted minds, as in all other complaints, require different qualities of climate, which experience alone, in many instances, will enable them to ascertain. Some derive more benefit from repeated changes of climate, others from a more prolonged sojourn in some particular spot.

As a general rule places are suitable for consumptive invalids, in proportion as they are generally healthy, and the climate favourable for out-door exercise. There is probably little truth in the idea entertained by many that sea-side places possess any advantage over dry healthy inland districts, except in so far as they possess the qualities of climate just mentioned. There are not wanting indeed authors who think that sea air is inimical in phthisical complaints. But this idea can hardly be seriously entertained in the face of the fact, that the inhabitants of the Ferroe Islands, and of Iceland, who live almost entirely on the sea-coast, are remarkably

free from tubercular consumption. It is also a well ascertained fact, that the naval, suffer much less from phthisis than the military, force, in proportion of 1.7 deaths in 1,000 annually of the former; to 8.9 to 1,000 annually of the latter in the men of the line, and 12.5 to 1,000 annually in those of the Guards; but this smaller mortality from consumption amongst seamen may with greater probability be attributed to the better ventilation of their sleeping apartments, and their more general out-door life, than to any specific quality of the sea air.

But whatever may be the question as to the relative merits of sea and inland air, either as a remedial agent in consumption, or as causative of the complaint in the first instance, I can never believe that any sea-side place can be suitable for consumptive people during the three spring months. However much the place may be sheltered from the north-east winds by rising hills behind, the coldness of the sea at this period of the year cannot fail to give a degree of chilliness to the air, which is always trying to persons suffering from chest complaints, and which, if not positively injurious (as in many instances no doubt it is), at all events gives the advantage to inland districts at this season. It is during the autumn and winter chiefly, owing to their more equable temperature, that dry sea-side places, like Brighton, possess a superiority of climate for consumptive invalids over inland districts.

In the last stages of consumption, if it be thought desirable from any cause that the patient should leave his home, the selection of the place of residence becomes very much a matter of convenience or choice on the part of the invalid or his friends. During the winter and autumn months the more equable and drier climates of the watering places on the south-coast, together with the greater facilities they afford for out-door exercise, and the numerous other conveniences such places possess, which add to the comfort of invalids, give them decided advantages over country places and most inland towns. Speaking generally, the more bracing and drier air of Brighton will be found most suitable for those cases in which general relaxation, and debility of the system, exhausting night-perspirations, copious expectorations, &c., are the predominant symptoms. The more relaxing and damper places of the south-west coast, as Torquay, are better adapted for those who suffer from a dry, irritating cough, general excitement, and irritability of the nervous system, with a tendency to inflammatory attacks.





